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Vox Sanguinis reports on important, novel developments in transfusion medicine. Original papers, reviews and international fora are published on all aspects of blood transfusion and tissue transplantation, comprising five main sections:

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2 Blood-Component Collection and Production Blood collection methods and devices (including apheresis); Plasma fractionation techniques and plasma derivatives; Preparation of labile blood components; Inventory management; Haematopoietic progenitor cell collection and storage; Collection and storage of tissues; Quality management and good manufacturing practice; Automation and information technology

3 Transfusion Medicine and New Therapies Transfusion thresholds and audits; Haemovigilance; Clinical trials regarding appropriate haemotherapy; Non-infectious adverse effects of transfusion; Therapeutic apheresis; Support of transplant patients; Immunotherapy

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Plenary Session - TRALI Update

PL-02 HOW DIFFERENT ANIMAL MODELS HELP US UNDERSTAND TRALI

Y Fung, and J Tung

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The 2016 FDA report shows that transfusion-related acute lung injury (TRALI) is still one of the leading causes of transfusion-associated morbidity and mortality. This is despite increased awareness of TRALI and the implementation of various strategies (e.g. use of predominantly male plasma products) to minimize its incidence. TRALI may be either immune/antibody-mediated or non-antibody mediated. But understanding the mechanism behind TRALI has been challenging because TRALI can be difficult to identify, the incidence is not high, and many of the clinical reports have been retrospective studies. Animal models provide a means of investigating the mechanism of TRALI in a controlled and systematic fashion. Small animals have the advantage of being easier to handle, have knock out strains and are relatively lower in cost. Large animals have the advantage of being more closely related in size to humans and support multiple sample collections. One of the earliest TRALI animal models demonstrated the immune-mediated mechanism. An ex vivo rabbit lung model revealed the role of anti-β2 (anti-HNA-3a) and granulocytes (Seeger et al. 1990). Mouse in vivo models infusing anti-MHC Class I monoclonal antibody (the 34-1-2s clone), and also rat and pig models, have provided further insights into the mechanisms of immune-mediated TRALI. Murine models have shown the importance of neutrophils (Looney et al. 2006; Kehler et al. 2009); neutrophil Fc receptors (Looney et al. 2006), neutrophil extracellular traps (Caudrillier et al. 2012), platelets (Looney et al. 2009), monocytes (Strait et al. 2011; McKenzie et al. 2014), and endothelial cells (Looney et al. 2006; Strait et al. 2011; Bayat et al. 2011). Elevated levels of C-reactive proteins (Kapur et al. 2015) and mechanical ventilation (Vlaar et al. 2010) may predispose to TRALI. Furthermore, protective roles have been identified with aspirin administration (Looney et al. 2009; Ortiz-Munoz et al. 2014), and with lymphocytes (Fung et al. 2014); T-regulatory cells and dendritic cells (both Kapur et al. Blood 2017). Mouse models have shown that IL-10 infusion either protects from TRALI if administered prophylactically or successfully treats an on-going TRALI reaction if administered therapeutically (Kapur et al. 2016).

An in vivo rat lung model by Silliman and co-workers introduced the non-immune mechanism of TRALI (Silliman et al. 1998). This non-immune mechanism has further been investigated using in vivo rat (Kehler et al. 2009; Silliman et al. 2011) and sheep models (Tung et al. 2011 and 2012). These models have demonstrated the importance of a priming event (e.g. endotoxin administration) and a role for the protein and lipid biological response modifiers that accumulate during routine blood product storage.

This lecture will chronologically review the key animal models of TRALI to show how each has helped us understand the immune and non-immune mechanisms behind TRALI. Better understanding of the underlying mechanisms is essential to guide effective TRALI minimization strategies.

Haemovigilance - Towards Safe Blood Transfusion

2A-001-02 IMPROVEMENT OF THE NEPAL BLOOD TRANSFUSION SYSTEM: AN ASSESSMENT OF TRAINING PRIORITIES

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Background: The Nepal blood supply system is centrally coordinated by Central Blood Transfusion Service of the Red Cross Society. In the aftermath of the 2015 earthquake a need for improvement was identified. With support of the Non Resident Nepali Association During a fact finding mission with the actual quality situation and related priorities for improvement were assessed. This assessment of priorities is used as input for the next steps, development of a tailor made training program of the three years project.

Aims: Improvement of Nepal’s blood transfusion system.

Methods: After two years of preparation Sanquin in collaboration with CBTS, during a fact finding mission, the actual situation was assessed to identify the next steps for improvement. To facilitate participatory collaboration a one day workshop was held with key stakeholders of the Nepal blood transfusion system. Including representatives of blood banks, the Min of Health, Nepal RCS and hospitals. The outcome of the meeting was a listing of priorities for improvement in five groups.

After the workshop this list was sent to main stakeholders in the country as a questionnaire. Stakeholders were asked to score the main priorities for improvement and add their opinion whether results are feasible for each priority within 2–3 years.

Results: Answers of key stakeholders revealed the priorities for the five groups on a National level for Nepal that are as summarized:

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THE EXPERIENCES OF A JOINT AUSTRALIA-CHINA QUALITY PROGRAM IN CHINA

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Institute of Blood Transfusion, Shanghai Blood Center, Shanghai, China

Background: In China, there are over 430 independent Blood Transfusion Services (BTSs) with broad diversity in operational scale. Since the majority of BTSs conduct blood screening for transmissible infections within their own laboratories, many of which differ in management and professional experience, EQAS is one of the key mechanisms to measure laboratories’ performance and improve the reliability and standardization of the blood screening results. In order to further improve the standard and quality of blood screening in China, a joint Australia-China quality program named China International Transfusion Infection Control (CITIC) was established in June 2011 through collaboration between Shanghai Blood Center (SBC) and NRL, Australia.

Aims: To review the experiences of the operation of CITIC EQAS from 2011 to 2016 and assess the testing results of blood screening laboratories in China based on 5 years data.

Methods: CITIC acts as a marketing and custom program department for National Serology Reference Laboratory, Australia (NRL) EQAS in China, but works beyond these fields, including EQAS orders, importation, transportation, data collection, report translation and troubleshooting, all with a focus on establishing a quality assurance system in China based on the CITIC EQAS platform. A series of training workshops, communication activities and collaborative scientific research works are also integral to the system. EQAS data were analyzed and summarized annually.

Results: Totally 129 registered CITIC participants have participated in the past 5 years. CITIC provides both NRL EQAS for blood screening serology testing and nucleic acid testing (NAT) and local designed EQAS for blood screening serology testing and blood component bacterial testing. EQAS yielded lots of transcription errors (0.1%-0.8%), false reactive results (0.3%-0.6%) and false negative results (0.01%-1.40%) by participants, but unacceptable results decreased yearly. 2 training and intercommunication workshops were carried out annually, which one was international workshop held by NRL, the other was local workshop in China.

Summary/Conclusions: CITIC EQAS was established in China successfully. It is considered valuable to further extend the experiences of the joint Australia-China quality program to developing countries to ensure blood safety.

A NEXUS BETWEEN VOLUNTEERISM AND BLOOD DONATION: A CASE STUDY OF PMAS ARID AGRICULTURE UNIVERSITY RAWALPINDI AND QUAI-E-AZAM UNIVERSITY ISLAMABAD PAKISTAN STUDENTS

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1Department of Pathology & Blood Bank, Rawalpindi Institute of Cardiology, Rawalpindi, Pakistan 2PMAS ARID Agriculture University Rawalpindi, Rawalpindi, Pakistan

Background: Volunteering behavior is socially based and happens at different rates in various geographical areas. Various barriers may continue to exist in community like concerns of family members or friends, religious or ethnic beliefs that influence the potential of voluntary non-remunerated donors but increase education about health and safety concerns may prove effective.

Aims: -To understand the motivational factors behind blood donation activities and response of family to blood donation act. -To find out the links between blood donation behavior and other volunteer activities of the university students.

Methods: This study was conducted in two most famous universities of Pakistan i.e. Quaid-e-Azam University, Islamabad and PMAS Arid Agriculture University, Rawalpindi. From both universities total 200 students (also the members of blood donor’s society) were randomly selected and face to face interviews were conducted for the collection of data. All the collected quantitative data were analyzed by SPSS 19.0.

Results: The major age group of our studied population was 23–27 years (n = 152). Respondents belong to all provinces of Pakistan but the majority was of Punjab province (n = 136). Results generated against questionnaire about the motivational factors and response of their families shows that: 52% of respondent’s mothers were illiterate, 77% became voluntary donors due to convincing by their friends, 68% students did not tell their parents about their voluntary activity, When further question was asked by the interviewer that why they did not told their parents about this volunteer act than 52% replied that due to the fear of restriction, 69% participate were also involve in other routine and emergency volunteer activities, in our studied population on 17% participants donated blood as a replacement donation, 34% participants donated blood 4-5 times, 100 percent respondents replied that there is no religious restriction regarding donation of blood voluntarily, 92% replied that the patient can receive blood of donor having different religion, they further stated that for blood transfusion the relationship is only of humanity. Summary/Conclusions: The study suggests that perceptions toward voluntary blood donation could be influenced to a large extent by socio-demographic variable. Socio-cultural barriers to voluntary blood donation exist in predominantly illiterate rural communities of the country but the young generation of Pakistan is the altruistic in nature. There is requirement of education, stimulation and motivate at national level especially to illiterate people of society to increase the number of voluntary blood donation. There is also need to make the Blood transfusion system more transparent in Pakistan.

A CASE STUDY OF PMAS ARID AGRICULTURE UNIVERSITY RAWALPINDI AND QUAI-E-AZAM UNIVERSITY ISLAMABAD PAKISTAN STUDENTS

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Western blot. Information from three provinces were combined and compiled by uploading the cloud platform. The platform and database from all blood services regions were forwarded to the blood center of Zhejiang province. All confirmed HIV donors were notified. Such donors were deferred permanently for future blood donations as part of the donor records in Yangtze River Delta Region. All blood services conducted predonation screening with DDR records.

Results: There is an estimated population of 200 million and 2 million blood donors every year in Yangtze River Delta Region. From April 2010 through July 2017, a total of 2455 donors were confirmed positive for the presence of HIV-1 in the study. No HIV-2 positive donors were found. All positive donors were deferred permanently. Three HIV positive donors concealed health and deferral history and attempted to donate at a second blood center. All three donors had been deferred by our donor deferral system and motivation of their donation was malicious.

Summary/Conclusions: The shared donor deferral system in Yangtze River Delta Region was valuable at the regional level to prevent deferred blood donors from donating at other blood services. It is urgent to establish a national donor deferral system in China.

Academy Session - Young Donors

2A-S02-01

YOUNG DONORS: GETTING THEIR ATTENTION AND KEEPING THEM ENGAGED

L Li
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Last year, Taiwan had an outstanding blood donation rate of 74.9 donations per 1000 people. However, Taiwan is transforming into an aging society with very low birth rates. Recent data showed a dramatic decrease in the number and participation rate of young donors. Therefore, in response, the nationwide Young Blood Program launched on June 14th, 2015. The aims of the program were to recruit and encourage young people aged 17 to 20 to donate blood 10 times within 4 years, and to motivate them to be regular donors. We proposed the following strategies:

1. To conduct promotional activities and educational programs in schools to let students know why, how, when and where to donate blood.
2. To obtain buy-in and support from school principals, responsible staff and student representatives.
3. To improve blood donation satisfaction, especially among first time donors.
4. To recruit a popular singer or celebrity as a donor ambassador.
5. To share short films of transfusion recipient and donor stories on YouTube, Facebook, LINE, etc.
6. To set up blood collection sites on campus as much as possible.
7. To study donor behaviors and attitudes, in order to find factors that influence young donors’ willingness to donate blood.
8. To invite students to visit blood centers and use student volunteers to further enhance youths understanding of the importance of blood donation.
9. To develop a new mobile app, which reminds donors to come back.

Results showed that 196,142 young donors joined the program, with approximately 43% returning for further donation during the past 2 years. Interestingly, the blood donation rate and return rate for female youth (47%) were higher than for male youth (40%). The numbers of young donors have slowly decreased since the implementation of the Young Blood Program. However, the young donor participation rate has stopped declining and has even shown a little growth. We will continuously improve our strategies and aim to succeed at meeting clinical demand by increasing the pool of regular young blood donors.

Best Abstracts

2B-S03-01

MINIMISING UNDOCUMENTED INFORMATION ON THE DONOR REGISTRATION FORM

C Yee Ling, P Marienelle Violeta, T Lesley PB and S Choon Hong William
Blood Resources, Health Sciences Authority, Singapore City, Singapore

Background: The national blood bank of Singapore under the purview of the Health Sciences’ Authority, has incorporated the requirement for staff signature and time entry, to various portions of the Donor Registration Form. This is important for documenting the completion of each stage of the donation process and for attaching accountability to the various staff who had attended to the donor. Routine checks through the Donor Registration Form has led the collection team to discover many incidences of omission in signature and time entry. However, to do a 100% daily re-checking and follow-up is not practical and time-consuming. Hence, the team decided to gather the forms of successful donations from all collection sites, for three consecutive months for the year 2016. The intention is to study weakness areas which often led to omission of signature or time entry.

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Aims: To ascertain the cause or reason for omission in documentation and propose a solution to minimise it.

Methods: Three consecutive months’ worth of Donor Registration Forms from all collection sites including mobile drives, adding up to a total of 29,268 copies were examined. From the data that was collected, it was found that the most common areas for omission of signature and time entry were -
- Signature of the staff
- Time the donor was received
- Indicating the blood mixer number
- The last donation date (which is more significance to mobile drives)

A survey was also carried out among 64 staff to test their knowledge on the ratio- nale for documenting certain information on the Donor Registration Form. Without making major changes to the original Donor Registration Form, the collection team redesigned the format and made draft copies for a new form. To promote accuracy and limit the likelihood of omission, provisions were made for more spaces as well as labeled boxes for entry of staff signatures and time. Related or similar information were also identified by specific colors such as user groups from registration staff, medical screening and donation room. Hence, any omission will be easily noticed. The new form was also careful not to cram too much information into one page. Rigorous feedback were solicited from all the staff and managers. A role play simulating the whole donation process was conducted using the newly designed forms. Overall turn-around-time at each stage of donation was also taken into consideration.

Results: The survey showed that overall the staff have good knowledge of the rationale behind documenting certain information. It also showed that a busy donation session or staff’s years of experience in the blood bank does not contribute to omission of information required in the form. The reason why it was still omitted could possibly be because the design of the Donor Registration Form did not provide sufficient spaces for signatures and time entries through all the stages of the blood donation process. Staff feedback about the new format however, cited that it was nearer, more organized and easier to check for omissions.

Summary/Conclusions: The Impetus for redesigning a new Donor Registration Form Stems from the discovery that many staff omitted their signatures and time-entry as a result of the lack of properly labeled boxes or spaces. This led to difficulty in conducting a thorough look-back if needed. With the newly designed form however, suited the needs of daily operations as well as allow for display and accessibility of information in an efficient manner.

Subjective adverse effects occurred in 2.6% in Control, 5.2% in PW, 4.2% in ORS, 2.7% in FJ, and 3.3% in AMT group donors. Presyncope occurred in 1.7%, 8.2%, 7%, 2.2%, and 4.4% donors respectively. Syncope occurred in 1.7%, 3.1%, 1.4%, 0%, and 1.1% donors respectively. Incidence of presyncope in PW was significantly higher vs Control (P = 0.026). Other group and adverse effect differences were not significant (P > 0.05).

Blood donation was associated with fall in SBP and rise in HR. Compared to mean SBP fall of 13.88 mmHg in Control, significantly more decreases were observed in PW (21.65 mmHg, P = 0.03) and ORS (21.65 mmHg, P = 0.000) but significantly less falls in FJ (7.67 mmHg, P = 0.001) and AMT (9.17 mmHg, P = 0.006). Similarly, compared to 2.33 beats per minute (bpm) mean increase in HR in Control, HR increase was significantly more in PW (5.03 bpm, P = 0.015) but not in PW (P > 0.05) in ORS (4.08 bpm), FJ (3.88 bpm), and AMT (3.82 bpm) groups.

Summary/Conclusions: Blood donation challenges the donor’s hemodynamic stability which is evidenced by falls in BP and rise in HR. Of the different measures to prevent or decrease severity of adverse effects, consuming 400 ml fruit juice 20 min before donation or practice of applied muscle tension during blood removal are more effective. The pressor response to ingestion of 500 ml plain water is slow lasting and is hugely challenged by the stress of blood removal. As a result, presyncope is commonest in prehydration with plain water.

2B-S03-03

MICRONRNA130A/PKLR AXIS REGULATES HCV AND HBV REPLICATION

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Background: HBV and HCV are important blood transfusion transmitted viruses. It has been shown to regulate miR-130a expression in infected patients and in infected cultured cells.

Aims: In this study, we identified and characterized miR-130a target genes and investigated the mechanisms by which miR-130a regulates HCV or HBV replication.

Methods: We predicted the possible target genes of miR-130a using four bioinformatics software including miRanda, TargetScan, PITA and RHAnahybird. Dual-luciferase reporter gene assays were performed to validate the target genes. miR-130a and its target genes were overexpressed, or knocked down by siRNA or by CRISPR/Cas9 gRNA in HuH7.51, JFH1, HepAD38 and primary human hepatocytes, respectively. Selected gene mRNAs and their proteins, together with HCV replication, were monitored by qRT-PCR and Western blot, respectively.

Results: The results showed that PKLR is a direct target gene for miR-130a. miR-130a overexpression down-regulated PKLR mRNA and protein levels while miR-130a inhibitor and gRNA increased PKLR expression. miR-130a mimic and PKLR knockdown inhibited HCV and HBV replication, while miR-130a gRNA and PKLR overexpression increased HCV and HBV replication. Supplemental pyruvate increased HCV and HBV replication and rescued HCV and HBV replication inhibition by miR-130a mimic and PKLR knockdown.

Summary/Conclusions: miR-130a regulates HCV and HBV production through its targeting of PKLR and its subsequent pyruvate production. Our data provides novel insights into understanding miR-130a regulated key metabolic enzymatic pathway steps, which are subverted by HCV and HBV replication.

2B-S03-04

RHD EPITOPE EXPRESSION OF FOUR NEW VARIANT RHD ALLELES IDENTIFIED IN THE CHINESE D VARIANT INDIVIDUALS BASED ON ERYTHROBLAST EXPRESSION SYSTEM IN VITRO

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Background: Four novel variant RHD alleles defined by the missense and deletion mutations (c.1154G>T, p.Gly385Val; c.79_81delCTC and c.710C>T, p.Leu237del; c.689G>C, p.Ser230Asn and c.79_81delCTC and c.710C>T alleles respectively using the anti-D reagent (D-SCREEN) when red blood cells were available. In this study, transfection analysis of the four variant RHD alleles in vitro cultured erythroblasts from

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D- donor were conducted to confirm the effect of the variant alleles on the expres-
in of RhD epitopes.

Aims: To confirm the effect of the four variant RHd alleles on the expression of RhD epitopes by using the cultured erythroblast expression system in vitro.

Methods: The four RHd mutations were introduced into a lentiviral vectors carried a wild-type RHd coding sequence, which was established by Sanquin Research, by using QuickChange II X1 Site-Directed Mutagenesis Kit (Agilent). Then, the lentivirus carrying the wild-type or four variant RHd alleles was prepared by transfecting HEK 293 cells with helper plasmids using the calcium phosphate method. The supernatant of the cultured HEK 293 cells containing the virus particles was then harvested. Meantime, the erythroblasts from three different Caucasian donors with D- pheno-
type were separated and cultured from the peripheral blood mononuclear cells and kept in the expansion medium for 2–3 days (van den Akker, 2010). The erythroblasts were then lentivirally transduced with the RHd wild-type construct or the four vari-
ant constructs. After 48 h transduction, the cells were differentiated and tested for RhD epitope expression by flow cytometry using 12 kinds of in-house monoclonal anti-D reagents and additional six monoclonal anti-D from the ALBA Active RHd typ-
ing kit (ALBA bioscience) against 11 D epitopes.

Results: RhD epitope expression data in vitro for RHd*79_BdelCTR and RHd*710T tested by flow cytometry were consistent with the RHd serological result obtained by D- Screen to show a partial D phenotype. For the other two variant RHd alleles carried the wild-type construct or the four variant RHd alleles was prepared by transfecting HEK 293 cells with helper plasmids using the calcium phosphate method. The supernatant of the cultured HEK 293 cells containing the virus particles was then harvested. Meantime, the erythroblasts transfected with the RHd*689A construct showed a partial D reaction pattern, while the erythroblasts transfected with the RHd*1547T construct showed a weak and partial expression of D epitopes tested by flow cytometry using the 18 monoclonal anti-D reagents.

Summary/Conclusions: Expression study in vitro confirmed that the four novel variant RHd alleles identified in the Chinese Han previously could abolish or suppress the expression of D epitopes to result in a variant D phenotype.

**ZB-S03-06**

**AN INHIBITOR OF EQUILIBRATIVE NUCLEOSIDE TRANSPORTER 1 FUNCTION, S-(4-NITROBENZYL)-6-THIOINOSINE (NBMPR), ENHANCES EXPRESSION OF ANTIGENS IN THE AUGUSTINE BLOOD GROUP SYSTEM**

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**Background:** The low-prevalence Aβ negative phenotype in the Augustine (AUG) blood group system is found in individuals homozygous for the variant, c.1171G>C, in SLC29A1. This missense mutation results in a p.Glu391Lys amino acid substitu-
tion in equilibrative nucleoside transporter 1 (ENT1), a multipass transmembrane glycoprotein on the red blood cell (RBC) membrane. A proposed low-prevalence antigen in the AUG system, identified via a case of hemolytic disease of the new-
born (HDN), was associated with c.1159A>C in SLC29A1 predicting a p.Thr390Pro in ENT1. A nucleotide analogue, S-(4-Nitrobenzyl)-6-thioinosine (NBMPR), has been shown to inhibit ENT1 nucleoside transport in vitro. We hypothesized that expres-
sion of AUG blood group antigens on human RBCs may be modified at NBMPR levels that inhibit transport activity.

**Aims:** To examine the effects of NBMPR on the interaction of antibodies against blood group antigens by flow cytometry.

**Methods:** NBMPR (Sigma-Aldrich) was tested at the minimum level reported to inhibit nucleoside transport [Takano, Drug Metab Pharmacokinet, 2010]. RBC sus-
pensions (0.09%, 20uL) were prepared from two Aβ positive random blood donors and incubated with NBMPR (20uL for final concentration of 1.5 mM, 2 min, room temperature (RT)) followed by two examples of polyclonal anti-Aβ, or examples of human polyclonal anti-D (for D-negative) or anti-K (for K-negative) (10uL, 30 min, RT). FITC mouse anti-human IgG (BD Biosciences) was added (20uL, 30 min, RT) for detection by flow cytometry. In addition, the maternal alloantibody implicated in the case of HDFN was tested against RBCs from two family members [father and first son] carrying the novel c.1159A>C mutation in SLC29A1 and serologically positive for the proposed AUG antigen. Median fluorescence intensities (MFI) for samples without NBMPR were designated as the baseline (100%) and differences in the pres-
ence of NBMPR were determined.

**Results:** NBMPR did not modify binding of anti-D or anti-K. In the presence of NBMPR, increased MFI for anti-Aβ was evident with an average of 124% for the first example and 138% for the second example. For the two examples of RBC expressing the proposed new low-prevalence antigen, the increase in MFI for the maternal alloantibody was 121% for the first example (father) and 119% for the second (first son).

**Summary/Conclusions:** At levels reported to block nucleoside transport, the EN1 inhibitor, NBMPR, enhanced binding of antibodies to the Aβ antigen and antibodies to a proposed new low-prevalence antigen in the AUG blood group system. The mechanism of this enhanced antigen expression is unclear, however, the presenta-
tion of antigen sites from the EN1 protein conformational structure in the presence of NBMPR may assist in antibody binding. That both are similarly enhanced may be expected as residues 387 and 391 are both in the same region of the EN1 molecule, the fifth extracellular loop. Alloantibodies to antigens in the AUG system are associ-
ated with transfusion reactions and HDFN; this assay, using an enzyme available in-
bitor, provides a novel addition to the serologists’ investigatory arsenal when antibodies to antigens in the AUG blood group system are suspected.
Academy Session – Transfusion Leadership

2B-S04-01 TRANSFUSION LEADERSHIP IN THE HOSPITAL
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Health care in the hospital environment, including across the various multidisciplinary transfusion processes, is increasingly complex. Transfusion practice involves different organizations [government/jurisdictional funders, the blood supplier, hospitals, professional bodies, regulators, accrediting and individuals including donors, staff groups such as managers, junior and senior medical and nursing, scientific, transport and clinical quality and also importantly, patients and carers. In the hospital setting a comprehensive, robust, collaborative, inclusive and effective clinical governance framework for oversight of local transfusion/blood management activities is essential for patient safety and optimal patient outcomes. Haemovigilance activities should include integrated systems, processes, leadership and culture applicable to all aspects of the hospital transfusion chain; the latter is intrinsically high risk, given the possible severe adverse outcomes of error, multiple potential vulnerabilities and often at least some areas not being supported by electronic systems. Strong and informed clinician leadership is a vital focus for inspiration, motivation and support to staff to work and aspire to excellence in transfusion practice; key leaders should ideally be involved with patient care at some level and facilitate a culture of collaborative teamwork, accountability, openness, engagement and improvement.

The hospital transfusion/blood management committee [TC], meeting regularly with a focus on actions, outcomes, improvement and staff/consumer engagement, is fundamental to good local haemovigilance. It should be integral to the hospital’s overall governance structure with clear accountability to execute so that effective change can be supported, resourced, implemented and maintained.

Recommendations are available as to appropriate TC membership, activities and reporting lines; these can be adapted to the individual environment to enhance functionality. Key clinical personnel representing areas of high blood use, the laboratory, clinical quality and crucially senior administration all contribute; it is also invaluable to have relevant external agencies present such as the blood supplier. Finding acceptable meeting times for busy clinicians is challenging; it is important to accommodate them and make effective use of their time when present. The TC leader should have accountability for and advanced content knowledge of transfusion, possess leadership qualities as above and work closely with a Transfusion Nurse/Officer; this might be a haematologist but a clinician from another discipline such as surgery or intensive care might act in this role to provide a different perspective and expand the capacity/experience of transfusion locally.

The agenda should encompass regular items and reports e.g. usage/wastage/compliance/audits and policy review but also consider illustrative cases, improvement and other projects, educational opportunities, new guidelines/research and information-sharing/benchmarking with other groups. Small TC working groups are critical to progress between meetings.

Enablers and barriers to good transfusion practice should be actively managed; these include system issues, evidence barriers and individual behaviours/beliefs. Staff/consumer engagement is facilitated by a multi-pronged approach; on-line learning modules, decision support tools/apps, alerts, case discussion, newsletters, improvement/research projects, unit/grand round presentations, unit/ward audits/feedback, brochures, displays etc. may all be useful.

Summary/Conclusions: The leadership is about the strategic thinking for the missions of a institution, and values to its customers and communities, and employees as well. While the management deals with means and efficiencies toward the missions. For institutions in industry sectors and other for-profit professions, market principles are decisive in defining leadership. While blood program is based on voluntary donations and indispensable in life-saving services, the leadership of BTS’s is then distinctive in terms of determining missions and values of the services, and strategies in resource mobilizations and talent competing. The concept and competence of leadership could and shall be developed in all possible means whenever possible within the local situations, by combining with and adapting theories into practices, and attending tailored courses. One of such examples is the Educational Course for Blood Service Leaders, initiated by Shanghai Blood Center and WHO Collaborating Center for Blood Transfusion Services in 2008, with CSBT, AABB and ISBT as co-hosts.

Clinical Transfusion

2C-S05-01 HAEMORRHAGE PROTOCOLS
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Much attention is understandably focused on trauma since this accounts for ~5 million deaths per year worldwide with haemorrhage being an important contributory factor. However it is important to recognize that major haemorrhage can be encountered in many clinical settings and while there are some key common principles, a discipline specific approach is also needed e.g. trauma, obstetric, gastrointestinal, paediatrics, oral anticoagulation and the logistics of the mass casualty setting also need to be considered.

Timely and systematic intervention is essential. This starts with the challenge of prompt recognition of serious life threatening haemorrhage followed swiftly with appropriate resuscitation coupled with any urgent action needed to control bleeding. The importance of haemorrhage protocols in supporting prompt resuscitation is commonly highlighted. Such protocols need to reflect the multidisciplinary approach required with emphasis on clear communication. In particular a breakdown of communication between clinical and laboratory teams is an important source of adverse events in this highly fraught situation. Accordingly, development of such protocols should be undertaken as a joint initiative between teams with a clear consensus on roles responsibilities and actions.

National guidelines based on review of current evidence where available can help underpin local guidelines. Hospital Transfusion Committees should help ratify such local guidelines with overseeing mechanisms for effective implementation including training of all staff involved supported by drills. A designated Team Leader, generally the most senior clinician on the scene, can help co-ordinate effective team working together with identification of a further member to facilitate clear communication with the transfusion laboratory and other support services.

Specific challenges to the development of haemorrhage protocols begin with determining appropriate triggers for activation. While there are several arbitrary definitions of major haemorrhage, e.g. loss of one blood volume within a 24-hour period, a more practical and pragmatic approach is needed for local protocols. Early use of tranexamic acid is supported by high quality evidence in trauma and now also obstetrics. There has been a shift to early use of empirical blood and component ratios in particular in trauma. While local protocols should enable the release of blood and blood components promptly to minimize delay to initial resuscitation, ongoing liaison is essential together with clarity around the role of laboratory testing or near patient testing to guide further issue.

Many centres employ haemorrhage protocols but compliance where studied has been reported to be variable. Some largely retrospective studies indicate some potential benefit in the use of such protocols but on the background of concerns about increased component wastage. In addition to audit of deployment of haemorrhage protocols, important lessons can be learnt with regular review of adverse events and by reporting these to haemovigilance schemes (www.shotuk.org).

There remain important research questions around early control of bleeding e.g. role of early fibrinogen replacement, use of whole blood, use of cold stored platelets being subjected to further scrutiny. Further active research is also needed to help define the optimum approach to management of patients with significant haemorrhage seen in a variety of clinical disciplines.
Preliminary findings suggest blood product transfusion may contribute to adverse patient outcomes following coronary artery bypass grafting.

METHODS: Using an ex-vivo whole blood culture model, the DC and monocyte phenotype was assessed (CD9, CD38, CD40, CD80, CD83, CD86, IL-6, IL-8, IL-10, IL-12, IL-1α, TNF-α, MIP-1α, MIP-1β, MCP-1, IP-10) with lipopolysaccharide (LPS) in parallel as a model of bacterial infection. Differences in inflammatory responses were associated with clinical outcomes for the entire patient cohort. Unstimulated DC and monocytes also had a reduced capacity to produce inflammatory cytokines. Un-transfused patients were randomly selected as controls for each group matched for the same underlying diagnosis. We assessed the pre-transfusion hemoglobin threshold and other clinical characteristics associated with transfusion.

Results: From the ~5000 patients who received transfusion, we chose 6 diagnostic groups: Surgical: Orthopedic surgery (case-controls: 312/316), general surgery (367,312); Medical: solid tumor (210/212), gastrointestinal bleeding (212/221), cardiovascular (87,77), and hematological malignancies (100,101). The mean hemoglobin concentration was 97.4 (367 ± 9.2 g/l) in surgical patients was 71.5 (37.8 ± 13.5 g/l). In surgical patients only pre-transfusion hemoglobin threshold was associated with transfusion. In medical patients, the independent factors associated with transfusion were primary diagnosis, hospital and age 75 ± 0.5. Compared with patients with solid tumor, the odds of transfusion were greater in those with underlying cardiovascular disease (OR = 2.5 (1.2–4.9), and less frequent in those with hematological malignancies, OR = 0.4 (0.2–0.6) and gastrointestinal bleeding, OR = 0.5 (0.3–0.8).

Summary/Conclusions: The pre-transfusion hemoglobin was the most important factor associated with transfusion in both medical and surgical patients. However, other clinical factors including age, cardiovascular disease, and primary diagnosis were also associated with transfusion in medical not surgical patients. Transfusion practice in 5 Chinese hospitals appears comparable to western countries in surgical patients although medical patients have lower pretransfusion hemoglobin levels. A clinical trial comparing transfusion thresholds common in China (60 g/l) versus Western countries (70-80 g/l) in medical patients would advance our knowledge about appropriate RBC transfusion thresholds in developing countries.
2C-S05-04
RED BLOOD CELL ALLOIMMUNIZATION AMONG THE TRANSFUSION RECIPENTS IN SANGLAH HOSPITAL DENPASAR BALI
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Background: Red blood cell alloimmunization is blood transfusion complication among the recipient. This is related to the frequency of antigen-positive blood transfusion received by the recipient as well as the genetic heterogeneity in populations. The immune response generated from the genetic differences between donor and recipient will induce the formation of alloantibodies. The impact of red blood cell alloimmunization for patients is the difficulty to obtain compatible red blood cells and higher risk of hemolytic transfusion reactions. Bali populations have little information about red blood cell alloimmunization.

Aims: The purpose of this study was to determine and analyze the characteristics of red blood cells alloantibodies in the recipient getting red blood cell transfusions in Sanglah Hospital Denpasar Bali.

Methods: We performed a cross sectional study among adult recipients with a history of red blood cells transfusion at least 3 times and willing to participate in this study during the period of December 2016 to March 2017 in Sanglah hospital.

Results: A total of 40 recipients were subjected in this study. Red blood cell alloantibodies detected in 5% of recipients and all of them were multiple alloantibodies with specificity of anti-K antibodies (%), anti-Kp% antibodies, anti-E (2.5%), anti-C (2.5%), anti-Lea (2.5%) and anti-Leb (2.5%). Overall alloantibodies were detected in women aged 46-65 years.

Summary/Conclusions: This is the first study on red blood cell alloimmunization in Bali, and we found frequently anti-K and anti-Kp%, so it could be a consideration, especially in Bali to perform erythrocyte antigen phenotyping, especially Kell antigen and doing cross-match for Kell system to prevent alloimmunization. More data are needed to examine incidence of red blood cell alloimmunization in Bali.

2C-S05-06
ESTIMATING THE IMMUNOGENICITY OF PLATELET ANTIGENS AND DEDUCING THE PREVALENCE OF ALLOANTIBODIES IN CHINESE
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Background: Platelet antigens and antibodies play important roles in several immune platelet disorders. The production of platelet antibody is determined predominantly by antigenic immunogenicity and mismatching, but the immunogenicity derived from Caucasian and antigenic mismatching possibility in Chinese are extremely lacking.

Aims: The aim of this study was to elucidate the immunogenicity of human platelet alloantigens (HPA) and CD34 antibody, and deduce the prevalence of platelet antibodies in Chinese.

Methods: Literatures concerning prevalence of platelet antibodies in Caucasian were reviewed and analyzed. The allele or antigen frequencies of HPA-1 to 6bw, 15, 21bw, CD34 and other low-frequency HPA (LHPAs, regarded as one antigen here) of Caucasian and Chinese were collected to calculate mismatching possibility of each antigen. The relative and absolute immunogenicity of each antigen was estimated and normalized using HPA-1a antigen as a reference antigen. We defined relative and absolute immunogenicity of HPA-1a antigen as 1.0 and 0.1015, respectively (anti-HPA-1a production in 10.15% of HPA-1a-negative pregnancy, referred to Turner, Transfusion, 2005). The antibody prevalence in Chinese was deduced using the immunogenicity derived from Caucasian and antigenic mismatching possibility of Chinese. The work was supported by National Natural Science Foundation of China (81570170) and Zhejiang High-Level Innovative Health Talents.

Results: The ranking of antibody prevalence in Caucasian was: 1a > 5b > 5a > 1b > 15a > 2b > 4a > 3b > 4b > 6bw > 6bw > 15b > 15a > 2b > 3b > 4b > 6bw > 3a > 15a > 21bw > 6bw > 2a (per cent range, 66.5% - 0%). The mismatching possibility of 15 antigens (including 15a, 2b, 4a, 3b, 15a, 21bw, 6bw, 2a) was 0.2005, 0.1738, <0.0009, 0.0031, 0.0020, respectively. The corresponding possibility was 0.0029, 0.0291, 0.1757, 0.1987, 0.0184, 0.0030, <0.0020, respectively. The relative immunogenicity of above 16 platelet antigens was 1.0, 9.5E-3, <3E-4, 3.5E-4, 1.7E-2, 1.7E-2, 2.9E-2, 2.4E-2, 8.3E-3, 1.5E-3, 1.0E-3, 7.0E-2, 2.2, 2.7E-1, respectively. The absolute immunogenicity of each antigen equals the product of relative immunogenicity multiplied by 0.1015. The ranking of the immunogenicity of 16 antigens was: 4a > CD16 > 1a > LHPA > 5a > 5b > 21bw > 4b > 6bw > 3a > 15a > 1b > 2b > 3b > 4b > 6bw > 2a. The absolute immunogenicity of each antigen equals the product of relative immunogenicity multiplied by 0.1015. The ranking of the immunogenicity of 16 antigens was: 4a > CD16 > 1a > LHPA > 5a > 5b > 21bw > 4b > 6bw > 3a > 15a > 1b > 2b > 3b > 4b > 6bw > 2a. The absolute immunogenicity of each antigen equals the product of relative immunogenicity multiplied by 0.1015.

Summary/Conclusions: The immunogenicity of 15 dominant platelet antigens and cumulative effect of LHPAs was determined. HPA-4a and CD34 antigens showed stronger immunogenicity than HPA-1a, and antigens in HPA-3 and HPA-15 systems showed relatively weak immunogenicity despite their high heterozygosity. The expected prevalence of antibodies against 1a, 1b and 5a was obviously lower in Chinese than in Caucasian, but antibodies against 21bw, 4a, CD34 and 6bw presented an opposite trend owing to higher mismatching possibility in Chinese. The cumulative prevalence of all platelet antibodies was lower in Chinese than in Caucasian on account of difference in antigenic mismatching possibility.

Immunohematology – Novel Technology

2C-S06-01
APPLICATIONS FOR KODECYTES IN IMMUNOHematology
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Red cells used in immunohematology are mostly limited to those that nature provides. Very few techniques are available for adding new functionalities to cells, without affecting their intrinsic functionality or vitality. Kode Technology involves surface modification technology that uses amphipathic function-spacer-lipid constructs to rapidly and harmlessly attach bioactive material to cell surfaces (creating kodecytes) and non-biological surfaces (kodiced surfaces). Originally designed to attach blood group glycans onto red blood cells for quality control use, the technology has since expanded to modification of any type of cell, enveloped virus, liposome and non-biological surfaces (including plastics, metals and glass). Today Kode Technology and the resultant kodecytes are being used in a range of cell-based diagnostics, as powerful research tools, and most recently as a potential immuno-oncotherapeutic agent; soon to enter human trials. Immunohematology applications and opportunities to use the technology in the form of kodecytes range from quality control kits, competency training panels, diagnostic reagents with synthetic rare blood group antigens or infectious disease markers. The constructs can be used for solid-phase antibody mapping and also have potential as therapeutics, including in vivo neutralization of ABO antibodies. Together with a large range of BSH constructs Kode Technology remains the most extensive and easy to use technology for adding bioactive material onto the surface of cells for research and diagnostics.

2C-S06-02
DYE-BASED STRATEGY FOR RAPID BLOOD GROUPING
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The blood grouping techniques have been developed for over 100 years, yet no any approach for simultaneous ABO forward and reverse grouping is commercially available although great attempts had been delivered in improving these techniques. The main obstacle lies in the completely opposite analytes existed either on the surface of red blood cell (RBC) membrane or plasma. As a result, a centrifugation step is inevitable for the ABO reverse grouping to remove any red blood cells. In this report, a brand-new generation of rapid blood grouping system has been promoted by rapidly and conveniently observing the color changes induced by different blood types. If the blood with specific antigens is loaded, the preloaded antibodies would capture corresponding RBCs and only plasma could keep swimming to the terminal to react with the dye, following by a prompt naked-eye visible color change. Whereas, if 0 type blood (without specific blood type antigens) is present, the whole
blood will swim to the terminal and change to brown, which can be easily discrimi-
nated from the former one using naked eyes. The whole turnaround time is less than 30 s for ABO forward test and 2 min for both forward and reverse tests. Furtherly, machine learning strategy could be utilized to automatically recognize measured spectroscopy data and make accurate decision on the distinctive blood groups. With this in mind, automated device could also be developed to fulfill high throughput and multiplex detection, making this strategy a versatile platform suitable for both blood donation screening in the field and routine blood grouping test in central hos-
pitals.

2C-S06-03
DNA OF ERYTHROID ORIGIN IN HUMAN PLASMA
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Background: There is much interest in the tissue of origin of circulating DNA in plasma. Data generated using DNA methylation markers have suggested that hematopoietic cells of the white cell lineages are important contributors to the circu-
lating DNA pool.

Aim: We would demonstrate that cells of the erythroid lineage would also release DNA into the plasma.

Methods: Using high-resolution methylation profiles of erythroblasts and other tis-
sue types, three genomic loci were found to be hypomethylated in erythroblasts but hypermethylated in other cell types. We developed digital PCR assays for measuring erythroid DNA using the differentially methylated region for each locus.

Results: Based on the methylation marker in the ferrochelatase gene, erythroid DNA represented a median of 30.1% of the plasma DNA of healthy subjects. In subjects with anemia of different etiologies, quantitative analysis of circulating erythroid DNA could reflect the erythropoietic activity in the bone marrow. For patients with reduced erythropoietic activity, as exemplified by aplastic anemia, the percentage of circulating erythroid DNA was decreased. For patients with increased but ineffective erythropoiesis, as exemplified by β-hemoglobinemia major, the percentage was increased. In addition, the plasma concentration of erythroid DNA was found to correlate with treatment response in aplastic anemia and iron deficiency anemia. Plasma DNA analysis using digital PCR assays targeting the other two differentially methylated regions showed similar findings.

Conclusions: Plasma erythroid DNA thus represents a noninvasive biomarker for differential diagnosis and monitoring of anemia.

Plenary Session – Therapeutic Possibilities for Thalassemia

PL2 - 01
OPTIMISING IRON CHELATION THERAPY WITH DEFERASIROX FOR NON-TX-DEPENDANT THALASSAEMIA PATIENTS: THE THESES STUDY
No abstract available

PL2 - 02
STEM CELL THERAPIES FOR THALASSEMIA
No abstract available

TTID – Hepatitis

PL2 - 03
RED BLOOD CELL ANTIGEN GENOTYPING FOR HEMOGLOBINOPATHIES: ARE THERE DIFFERENCES BETWEEN THALASSEMIA AND SICKLE CELL DISEASE?
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Chronic red blood cell transfusions remain an essential therapy for patients with thalassemia and sickle cell disease. Management and prevention of alloimmunization is a critical aspect of chronic red cell therapy. DNA-based genomic approaches for extended red cell antigen profiling of both patients and blood donors now offer substantial improvements to mitigate alloimmunization complications inherent with transfusion therapy. Since most red cell antigens result from single nucleotide polymorphisms (SNPs), typing by DNA methods is relatively straightforward and has become an important part of the practice of transfusion medicine. The results are highly correlated with serologic phenotyping, and are superior in situations of recent transfusion or the presence of a positive direct antiglobulin test (DAT). The ability to determine the patient or donor antigen profile in one assay increases accuracy; provides information for antigens for which no typing reagents are available and for some institutions, can replace serologic typing at lower cost. Routine ABO and RhD typing is not done by DNA methods as the sole method due to the large number of different mutations that result in a Group O or a RhD negative phenotype. Genomic approaches to transfusion management provides new opportunities to mitigate morbidity and mortality due to alloimmunization. This lecture will discuss the practical integration and the value of a genomic approach to improve outcomes and prevent complications in patients with hemoglobinopathies. Differences between management of patients with thalassemia and sickle cell disease will be discussed.

1A-S07-01
HEPATITIS C VIRUS: FROM DISCOVERY TO CURE
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Hepatitis C Virus (HCV) infects 71 million people worldwide. Up to 85% will develop into chronic infections. Since its discovery, numerous achievements have been made in the field of HCV research, especially in sequencing HCV whole genome, in develop-
oping HCV replicon and in vitro cell culture (HCVcel) system, in understanding the molecular mechanisms of HCV resistance to interferon-based therapy and in develop-
ging novel treatment regimens that specifically target HCV protease and poly-
merase. All these achievements make HCV infection a curable viral disease. A brief history of HCV from its discovery to cure will be presented in line with author's own scientific contributions to HCV research, especially in identification of the host genes that can be used to predict treatment response and the role of ISG15/USP18 signaling pathway in HCV resistance to interferon-based therapy. Experience learned from HCV research that may help us manage other transfusion-transmitted infectious diseases will also be discussed in this talk.

1A-S07-02
PREVALENCE STUDY OF HEPATITIS E VIRUS (HEV) IN SINGAPORE DONOR POPULATION WITH THE USE OF PROCLEIX HEPATITIS E VIRUS ASSAY ON PROCLEIX PANTHER SYSTEM
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Background: HEV is classified into 4 major genotypes. Genotypes 1 and 2 are transmitted primarily through contaminated water and fecal-oral routes, while geno-
types 3 and 4, commonly found in domestic and wild pigs, are the cause of human infections associated with consumption of undercooked meats and shellfish. HEV Genotype 3 or 4 infections in humans are largely asymptomatic and are considered as an emerging threat to blood safety. Immunocompromised recipients who acquired HEV via blood components and transplant are at risk of chronic liver diseases.
Reports of transmission–transmitted HEV infections have been documented in several countries in Europe and Asia. In Singapore, there are currently no studies of HEV prevalence among the blood donors.

**Aims:** To study the prevalence of HEV infection in Singapore's blood donor population.

**Methods:** Nucleic Acid Test (NAT) were performed on 12,541 donations using the Procleix HEV Assay on the Procleix Panther System from 20th February to 26th March 2017. The Procleix HEV Assay is a qualitative NAT assay that can detect all 4 genotypes of HEV using transcription–mediated amplification technology. In this study, testing was performed by individual sample testing. Samples which were found reactive were repeated on the Procleix HEV Assay and further tested for HEV antibody (IgG and IgM) and an alternative NAT by real-time PCR. In addition, genotyping was done for the NAT reactive samples.

**Results:** 28 donor samples were tested reactive on the Procleix HEV Assay. Out of which, 17 samples were NAT repeatable reactive (RR) and tested positive on the HEV real time PCR test. Only 4 NAT RR samples were tested HEV IgG and IgM positive. 2 weak positive HEV PCR (with low level viral load) results were found in the remaining 11 initial reactive (IR) samples and the other 9 IR samples were all negative for HEV PCR. The 2 weak positive HEV PCR samples were HEV IgG and IgM positive while 1 IR NAT/HEV PCR negative sample was tested positive for IgG only. 8 of the 19 PCR positive samples were successfully genotyped and all are determined to be Genotype 3.

**Summary/Conclusions:** The HEV prevalence rate for the blood donors in Singapore is established at 0.15%. The present results demonstrated a higher prevalence when compared with the infection rates reported in several countries who has conducted similar studies using similar assays. The findings in this study will be incorporated in the risk-based decision making framework for blood safety by BSG to assess the need for HEV NAT screening of asymptomatic donors to ensure blood safety in Singapore.

**References:**

1. Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad, Pakistan
2. Safe Blood Transfusion Programme, Ministry of National Health Services, Government of Pakistan
3. Department of Pathology and Blood Transfusion Services, Shehzeed Zulfiquar Ali Bhutto Medical University, Islamabad, Pakistan
4. Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad, Pakistan

**Background:** Hepatitis B virus (HBV) is a major causative agent of early, severe and prolonged liver infection that subsequently leads to cirrhosis of liver and hepatocellular carcinoma. Blood safety is a serious issue all over the world because of Transfusion Transmitted Infections and whole blood has to be screened before transfusion against these infections including HBV. HBV sequence is characterized by > 8% nucleotide differences for genotype, and 4%/8% nucleotide differences for sub-genotype, as HBV reverse transcriptase lack proof reading activity.

**Aims:** The aim of this study was to evaluate the molecular epidemiology of HBV genotypes and comparison of serological assay performance versus PCR in HBV screening.

**Methods:** Blood samples of 8,517 healthy blood donors were collected during the period of November 2016 to April, 2017 from Blood Bank of Shaheed Zulfiquar Ali Bhutto Medical University, Islamabad. Samples were screened for HBsAg assay by using technique of Chemiluminescence Immunoassay on ARCHITECT i2000SR Immunoassay Analyzer and protocols provided by Abbott Diagnostics, USA. PCR of positive samples was carried out using already reported genotype specific primers by Naito and colleagues (2001). The results were confirmed by visualizing genotype bands.

**Results:** The study confirmed the presence of HBV in 2.5% of blood donors and PCR confirmed the presence of HBV-DNA in 92 samples. The genotyping was done by PCR using type-specific primer sequences. PCR was dogged to check six genotypes, i.e. A, B, C, D, E and F. The results of this study shows high levels of genotype D is this region, i.e. 52.17% with less dominating genotype C, which is 16.30% with decreasing ratio of genotype E (14.13%), genotype A and B (9.78%) and mixed D+E (2.17%). The presence of coinfection is found at lowest rate. Due to high percentage of HBV/D, it is concluded that genotype D is common in our population.

**Summary/Conclusions:** The most prevalent HBV genotype in Islamabad region was genotype D which is responsible for liver cirrhosis and hepatocellular carcinoma. Efficacy of drugs varies with variation in genotypes of hepatitis B virus and also with geographical distribution. So before treatment, full flagged information of HBV genotype is required to start a beneficial and efficient treatment. And there is also need to design drugs on the basis of genotypes.
More than 2.9 Million units of blood are collected annually in Korea, among which about 92% is collected by the Korean Red Cross blood services (KRCBS). These collections are processed further into blood components and the KRCBS supplies about 5.9 Million units of blood components each year. To accomplish this task, the KRCBS operates 15 blood centers, 138 fixed donation sites and 3 blood laboratory centers nationwide and employs more than 2100 people. Blood service operation in Korea is regulated under the Blood Management Law and KRCBS has standard operating procedures (SOP) in place to facilitate consistent conformance to technical and quality system requirements. Continuous education and acknowledgment of the competence of each staff member are essential to the quality and safety of donor services.

To keep pace with changes in the sector. The outcome of this should be a reduction of higher concentration has higher potency. Education is also an ongoing process and requires regular updates and reinforcement to cater for different stages of the nurses’ career, learning styles and individual needs. Transfusion risks, and the principles and benefits of patient blood management (PBM) are well documented in the literature. PBM aims to achieve improved patient outcomes by promoting appropriate transfusion practice, including effective conservation and management of a patient’s own blood. One of the challenges is to ensure that all multidisciplinary team members who work in these areas are aware of the risks, benefits and principles associated with PBM and administration of blood products, and undertake their practice accordingly. Context: Nurses and transfusion practitioners, working in areas where blood/blood products are transfused, or where PBM is practised, need to have both knowledge and skills to undertake their roles safely and effectively. This is achieved predominantly through education/training across the continuum of the nursing career, and aligned with the practitioner’s scope of practice and career path. The focus of education/training commences with acquisition of basic knowledge and development of competencies for safe administration of blood components, through to critical-thinking and leadership skills required to implement transfusion and/or PBM practice improvement initiatives within a department/health service. Patients and carers should be informed of the risks and benefits of blood and blood products, and any available alternatives, when a plan for treatment is developed. Nurses play a key role in providing this information to support patients and carers, so that they can be active partners in transfusion decision-making as part of their care and treatment. Delivery modes: There is a range of education opportunities offered in Australia. Broadly these include:

- Undergraduate curricula that provide basic transfusion knowledge, skills development, simulation and experiences during work placement. The scope and breadth of these vary between institutions as we do not have a national defined curriculum framework. Continuing professional development is provided by organizations such as BloodSafe eLearning Australia, the Australian Red Cross Blood Service and local hospital educators. In hospitals and healthcare organizations this is driven by hospital accreditation standards and guidelines. On an individual professional level, nurses are required to meet continuing professional development obligations for ongoing registration, and transfusion education can assist them to meet these requirements.

- Postgraduate qualifications offered through Blood Matters/The University of Melbourne. This course is primarily aimed for healthcare professionals to build their skills and knowledge, to include more advanced concepts, along with practical approaches to change management, audit and leadership.

Australian education and training is provided in a range of delivery modes, for example: informal/formal situational learning, workshops and tutorials, didactic lectures, synchronous/asynchronous online learning, case study reviews, research projects and professional conferences.

Conclusion: Education is fundamental to ensure that staff working in the area of transfusion and PBM have the knowledge and understanding to provide high quality, effective and safe patient care. Education is provided in a variety of formats to cater for different stages of the nurses’ career, learning styles and individual needs. Education is also an ongoing process and requires regular updates and reinforcement to keep pace with changes in the sector. The outcome of this should be a reduction in errors and risk, and improved patient outcomes.
Summary/Conclusions: We have established a hand-drop method for in vitro platelet phagocytosis study, where the adhesion and activation of cells are expected to be inhibited as cells are totally suspended without contacting any surfaces. The percent-age of CMFDA/CD41+ cells can be calculated to evaluate platelet phagocytosis mediated by antibodies in human serum in comparison to controls. The results are stable among tests using different batches of PBMCs. Furthermore, as is performed with cytopreserved PBMCs and flow cytometry, this assay is a simple and quick method which may find wide application in evaluation of platelet phagocytosis and effects of platelet transfusion.

Aims: In this study, we asked the question whether endothelial cells are important target for anti-HPA-15 antibodies. The CD109 expression on HPA-15 phenotyped endothelial cells was analyzed by flow cytometry. Binding of anti-HPA-15 antibodies in patient's sera with endothelial cells was measured by modified antigen capture assay (MAIPA). The effect of anti-HPA-15 antibodies on endothelial function was studied by tube formation assay.

Methods: The HPA-15 expression was determined on the human umbilical vein endothelial cells (HUVECs) by flow cytometry. Analyze anti-HPA-15 antibodies with HUVECs by MAIPA assay. Detect the effect of the anti-HPA-15 antibodies on endothelial function by tube formation assay.

Results: The average MFI of CD109 expressed on different HUVECs is 1730 ± 218.26 (negative control: 108.46 ± 32.3). No significant difference was observed between different HPA-15 phenotyped. Analysis of anti-HPA-15 antibodies with phenotyped HPA-15aa and HPA-15bb endothelial cells showed stronger reaction when compared to platelets. Antibodies against CD109 inhibited endothelial cells tube formation. In the control experiment, antibodies against platelet specific allotypes complex did not alter endothelial tube formation. In contrast, antibodies reacted with endothelial myeloid complex inhibited significantly tube formation.

Summary/Conclusions: Our results indicated that endothelial cells may represent a better target for the analysis of anti-HPA-15 antibodies. Anti-CD109 antibodies can impair the angiogenesis of endothelial cells and may play the role by the development of endothelial dysfunction.

A NOVEL DI*02(T853M) ALLELE ABOLISHING THE EXPRESSION OF DI2 ANTIGEN

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Background: The Diego blood group system consists 22 antigens, which is expressed on the band 3 protein that is encoded by the solute carrier family 4, anion exchanger, member 1 (SLC4A1) gene. The antithetical antigens, DI1 (D[*]) and DI2 (DII), are encoded by the amino acid p.854Leu(c.2561T) and p.854.Proto(c.2561C), respectively. Compared with the rare distribution of DI1 antigen in the Caucasian population, there is a polymorphic distribution in most Mongoloid populations including the Chinese. Allelobody against the DI1 and DI2 antigens could cause mild to severe hemolytic disease of fetus and newborn. Currently, the commercial antisera against DI1 and DI2 antigens are not available in China, several genotyping methods including polymerase chain reaction—sequence-based typing (PCR-SBT), high-resolution melting (HRM) and polymerase chain reaction with allele-specific primers (PCR-SSP) have been developed for DI1/DI2 genotyping analysis. In our previous study, one novel DI*02(T853M) allele accompanied with one wild-type DI*02

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MILTENBERGER BLOOD GROUP ANTIGENS

Aims: The aim of this study is to make monoclonal antibodies to detect Miltenberger blood group antigens. Since their complexity and the lack of commercial antiserum, these antigens are the only equipment that can manage the tremendous number of cells necessary and meet the requirements for clinical trials. Aims: This study aims to develop robust automated production systems and continuous process assessments using bioreactors and supporting culture media for successful culture of the RBC products in clinical settings.

Methods: Cord blood CD34+ cells were isolated and differentiated to erythroid progenitor cells in 2-dimensional plates. Then, the cells were transferred and cultured in differentiation media with various additives using a stirred bioreactor. To develop the best parameters, several culture conditions and media were compared. Results: We successfully developed a RBC production process using a bioreactor that showed very effective maturation and enucleation up to 94% with high viability. The produced RBCs showed similar functions compared to donor fresh RBCs and could be stored for one month.

Summary/conclusions: The optimized culture process using bioreactors would make possible to produce transfusable RBC products in a large scale.

3B-S10-01
MANUFACTURING RED BLOOD CELLS USING BIOREACTORS

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Background: In vitro production of stem cell-derived red blood cells (RBCs) is a promising alternative to donor blood as the blood donor pool decreases. Evolving from the conventional 2D plate culture, large scale manufacturing using bioreactors is an inevitable process for better productivity and efficiency in making RBCs. Bioreactors are the only equipment that can manage the tremendous number of cells necessary and meet the requirements for clinical trials.

Results: We successfully developed a RBC production process using a bioreactor that showed very effective maturation and enucleation up to 94% with high viability. The produced RBCs showed similar functions compared to donor fresh RBCs and could be stored for one month.

Summary/conclusions: The optimized culture process using bioreactors would make possible to produce transfusable RBC products in a large scale.

3B-S10-02
AFFECTION OF FBXL10 ON HEMATOPOIETIC CELLS FROM HUMAN CORD BLOOD

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Background: Histone demethylase F-box and leucine-rich repeat protein 10 (FBX10), also known as Jhdm 1b or Kdm2b forms complexes with polycomb-group proteins, essential regulators of hematopoietic stem cells (HSCs). Aims: CD34+ hematopoietic stem cells are the important resources of HSCs in clinic transplantation for hematologic diseases. In this study, we explore how FBX10 affects this cell population.

Methods: We constructed the recombinant plasmid of PTTS-TAT-FBX10. Tat-FBX10 fusion protein was acquired by eukaryotic expression system and added to the cell culture system. The impact of FBX10 on CD34+ hematopoietic cells was analyzed by western blotting, cell counts, flow cytometry, in situ methylcellulose colony assays and CCK8 assays.

Results: FBX10 was imported into CD34+ hematopoietic cells by Tat, a kind of cell penetrating peptide. FBX10 encodes a demethylase specific to the histone H3 mono/di-methylated at lysine 36 (H3K36me1/me2). After 7 days, the relative H3K36me2 level in hematopoietic cells from cord blood was obviously decreased, which indicated that Tat-FBX10 fusion protein had normal bioactivity. Compared with control groups, FBX10 neither expanded the number of CD34+ hematopoietic cells nor maintained the expression of CD34. Moreover, FBX10 could not augment the colony-forming capacity of CD34+ hematopoietic cells. However, in 21-day culture, the activity of cells treated with Tat-FBX10 was significantly increased (P < 0.05) in CCK8 assays.

Summary/Conclusions: Our findings implicate that FBX10 increased the vitality of CD34+ hematopoietic cells in long-term culture, thus highlighting a role of histone demethylation in the epigenetic regulation of CD34+ hematopoietic cells from human cord blood.
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In this study, we detected both of the surface and soluble expression levels as immune surveillance. It is reported that HLA-E expression alteration or allele specificity may inhibit NK cell activity by CD94/NKG2A and play a crucial role in NK cell-mediated killing. HLA-E is one of the non-classical HLA molecules with limited polymorphism.

Methods: We compared all three indexes with the healthy individuals from the same population, as well as their correlations with the genotype of HLA-E in Chinese Leukemia patients.

Results: There were no clear defects in patients. The increased Treg were mostly derived from tTreg on the thymus. Enhanced phosphorylation of Stat5 in A20 deficient mice, while in A20 deficient mice, illustrating that the increased Treg were mostly derived from thymus. A20 deficiency accelerated Treg cell proliferation and apoptosis. The Treg cells' were analyzed by flow cytometry for the frequency and number in thymus and periphery, the signature molecules CTLA-4, CD73, FR4, GITR. Treg cells' were analyzed by flow cytometry for the frequency and number in thymus and periphery, the signature molecules CTLA-4, CD73, FR4, GITR. Treg cells' were analyzed by flow cytometry for the frequency and number in thymus and periphery, the signature molecules CTLA-4, CD73, FR4, GITR.

Summary/Conclusions: Our experiments revealed that there were no clear defects appeared in the conventional T cell development in A20 deficient knockout mice. It is clear that A20 knock out has no effect on the proliferation and apoptosis at the generation of tTreg on the thymus. Enhanced phosphorylation of Stat5 in A20 deficient mice, while there is no significant difference of ERK1/2 and Akt, which illustrate that A20 may influence the expression of several Stat5-target genes by regulating phosphorylation of Stat5. This high sensitivity of IL-2 is known to be crucial for Treg survival.

Background: We tested to detect and evaluate capability for precise copy number discrimination. 162 blood samples were collected and amplified by qPCR and analyzed by the qPCR method we established. Sequencing results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous.

ESTABLISHMENT AND APPLICATION OF A QPCR METHOD FOR KIR3D1L GENE COPY NUMBER DETERMINATION

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Background: Killer cell immunoglobulin like receptors (KIRs) are glycoproteins expressed on the surface of natural killer (NK) cells and a few subsets of T cells playing significant roles in immunity, pregnancy and transplantation. KIR genes exhibit high diversity in allele copy numbers and haplotypes, which have been shown to correlate with protection from certain viruses such as HCV and HIV. But, routinely used sequencing based technology cannot detect KIR copy numbers. Thus, there is a need to develop a new method.

Aims: To establish a copy number assay method by quantitative polymerase chain reaction (qPCR) to determine copy number for KIR3D1L in situ, and obtain alleles present in this locus.

Methods: Genomic DNA of a random sample was diluted to 12.5, 2.5, 0.5, 0.1 and 0.02 ng/µl, respectively. KIR3D1L which always has two copies in a diploid genome was used as internal control and amplified by qPCR, and Sybr green was used as fluorescent dye. 162 blood samples were collected and amplified by qPCR and diluted to diluted to unified concentration according to concentration-Cp standard curve of 3DL2. Cp values of 3DL1 for all diluted samples were obtained by a second qPCR. ΔCp (Cp3DL1 - Cp3DL2) were calculated and compared with a reference sample of fixed copy number to obtain the copy number of each sample. All the PCR reactions were performed in 20 µl volume containing about 50 ng genomic DNA in 1× LA buffer, 0.5 µmol/l of each primer, 200 µmol/l of each dNTP, 2.0 mmol/l MgCl2 and 0.5 unit of LA Taq DNA polymerase and 10µl SYBR Green. The PCR reaction condition was 95°C for 3 min, 45 cycles of 94°C for 20 s, 63°C for 40 s. The genotype frequencies and allele frequencies were calculated by direct counting.

Results: Sequencing results showed that, of the 162 individuals, 151 were 3DL1 positive, and of which, 89 were homozygous and 62 were heterozygous. Copy number assays showed that the 62 heterozygous samples all contained two copies of 3DL1 allele, 41 of 89 homozygous samples contained two copies of 3DL1 allele, 46 of 89 homozygous samples contained only one copy of 3DL1. The distributions of 3DL1 genotype and allele frequencies calculated by copy number assays were different from that with copy number assays. The frequencies of 3DL1 containing two copies were 41.06% without copy number assays, but were 69.54% when tested by copy number assays. Twenty-one genotypes were obtained according to copy number assay and sequencing results. But, there are only 19 genotypes if the copy number is not calculated.
Quality monitoring and evaluation in transfusion medicine is particularly important for several reasons: biological origin of blood components which implies variability of both the initial material and the final products, specific risks associated with transfusion treatment, complex algorithms of donor selection and testing, many inter-connected segments combining laboratory medicine, clinical medicine and pharmaceutical production.

The Aims are to have a harmonized and optimal suited quality monitoring and risk management system. Standards and criteria for quality monitoring and risk assessment have been addressed based on (1) a survey platform on quality management by the ISBT working party on quality management, (2) the critical control points (CCPs) and cross references given in the EuBiMS manual and guide and (3) the level-based accreditation model developed by the AFSBT. These include inter-alia good practice guidelines (GPG) (EDQM, Directive 2016/1214) and good manufacturing practices (GMP) to cover blood, blood components and medicinal products for human use.

Quality monitoring requires well defined quality indicators and a systematic process release parametric system. Differences between processes have to be addressed including equipment, facilities and training of staff with respect to the complexity. Quality monitoring will also require to set up a standard operating procedure (SOP) and documentation system site-by-side with GMP/GPG related change control processes (CCPs) covering validation and qualification. 78% of the blood establishments surveyed responded the need to improve areas of quality with 65% related to national requirements. From the (Q) survey results, particular emphasis will also include monitoring premises and infrastructure requirements. Installation (IQ), operational (OQ) and process (PQ) qualification, systematic process identification using risk assessment matrices and/or the Ishigawa fishbone diagram technique. In order to assist quality monitoring of processes, a core set of 11 out of 16 IQ have been defined by the working party of quality management comprising (1) venipuncture failures, (2) Donor adverse reactions (3) Donor complaints (4) Positive findings on blood product bacteriological testing (5) Wrong blood product issue (6) Blood product complaints (7) Product withdrawal from the market (8) Patient sample non-conformities (9) Non-conformities in the requests for pre-transfusion testing (10) ABO/Rh(D) discrepancies (11) Serious adverse events (SAE). Furthermore, standards and criteria for SOPs/QMS as well as inspection of these have been defined via the EuBiMS guide to be used as a tool to assist blood transfusion services to promote the safety of blood and blood components or for competent authorities, who are authorizing and inspecting those blood establishments.

In conclusion, quality monitoring and risk management in transfusion medicine is especially important, considering the biological origin of blood components and specific risks associated with their use. These activities should be strategic and proactive and not reactive. Risk management is important for the safety of donors and patients but also for the reduction of waste.

Acknowledgement: We would like to thank the contribution given by the members of the ISBT working party on quality management. This work has been supported in part by funds of the European Commission initiating the EuBiMS Academy (grant 2006202 and contract 2011(S 167-275198) and funding of the ISBT to the working party.
Immunogenetics – Abstract Session

3B-S12-01
PHENOTYPIC CHARACTERISTICS OF NOVEL RH D VARIANTS IN INDIANS

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Background: The RhD antigen being unarguably the most clinically significant antigen of the blood. Self-inspection is also the base of different types of assessments. To set up the self-inspection procedure for whole facility, to familiarize staff with internal-audit process, carry out the self- inspection on a regular basis and find what is still needed to do for improving the QMS. The secret to a successful and efficient self-inspection is adopted standards, inspection plan, result assessment and correction action. Usually identify the contents of inspection scope, findings, NCs, observations, time to corrective action, and conclusions with clear statement about the outcome. According to the severity degree, the NCs found in self-inspection are classified into 4 categories: critical non-compliance, major non-compliance, other significant non-compliance and observation. Identify NCs with clear classification and examples, references, pictures, copy can help to plan action to implement corrective measures. Urgent measures may be needed under the urgent decisions. Deficiencies that have been corrected during the inspection should be included in the inspection report with a statement that it has been corrected. BE’s inspections, control measures, corrective and preventive actions should be a dynamic, active and continuous process, aiming quality and safety. Following the implementation of new preventive measurements, a new inspection may be needed and scheduled. NCs high and will reduce over time with handling the NCs. In conclusion, self-inspection can help the BE to correct NCs as quickly as possible, use self-inspections as part of learning process, recognize efforts of staff, evaluate the facility’s quality and operational systems to determine whether the service they provide is appropriate and in control.

Acknowledgement: We would like to thank the contribution given by the members of the ISBT working party on quality management. This work has been supported in part by funds of the European Commission initiating the EuBiSA Academy (grant 2006202 and contract 2011/5167-275198) and funding of the ISBT to the working party.

3B-S12-02
IDENTIFICATION OF A LARGE GENE FRAGMENT DUPLICATION INVOLVING THE SMP1 AND PART OF THE RHD AND RHCE GENES IN ONE CHINESE DONOR

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Background: A series of complex molecular events has been reported to resulting in the normal, absence or weaken/partial expression of D antigen, such as point mutation, short or large deletion, insertion, splicing site mutation and hybrid allele, but no duplication has been identified before. The developed Multiplex Ligation-dependent Probe Amplification (MLPA) genotyping assay contains probes specific for RH D and RHCE consensus cons names and issues that could not only determine the presence of consensus and mutant RH D and RHCE sequence but also its copy number. In previous study, this Chinese donors having three copies for all probes specific for the exons 2–10 of the RH D gene but with two normal copies for the probes specific for RH D 5'-UTR was identified by MLPA.

Aims: To confirm the existence of the duplication of the RH D gene and clarify the exact region of duplication in the Chinese donor using the next generation sequencing (NGS) method.

Methods: Genomic DNA of the donor was extracted and then send to a Chinese biological company (the Beijing Genomics Institute, Wuhuan, China) for the whole genome sequencing using Illumina HiSeq 2000 platform. The raw data was aligned to the reference sequence (Human genome 19, hg19) using Burrows-Wheeler Aligner (BWA) software. Then, the further bioinformatics analysis of variant calling around the RH D gene on the chromosome 1 was performed to define the two ends of the duplication region, by using the CNVs (copy number variations) analysis which correspond to relatively large regions of the genome that have been deleted (fewer than the normal number) or duplicated (more than the normal number). Results: A large fragment with a length of 93,800 bp was identified to be duplicated having a ratio of 1.49 for the copy number shown by the CNV analysis, which indicates three copies existence compared with the normal control with a ratio of 1.0 having two copies for this region. The large duplication region of 93,800 bp was annotated from IVS1-862 of the RH D gene to IVS7-2081 of the RHCE gene covering the whole genomic sequence of the SMPI 1 gene located between the RH D and RHCE genes. Besides, a short deletion region within the RHCE gene with a length of 6000 bp was also found in this donor with a normal CCDee phenotype. The copy number for the region was shown with a ratio of 0.17 indicating a deletion by the CNV analysis. The deletion region was defined from IVS2-1064 to IVS1-940 of the RHCE gene involving the whole coding sequence of the exon 2 of the RHCE gene.

Summary/Conclusions: A large duplication fragment involving the SMPI 1 and part of RH D and RHCE genes occupying a deletion covered by the exon 2 of RH D gene were firstly described. How the large duplication and the short deletion happened and its effect on the expression of D, C, c and e antigens are needed a further investigation.
3B-S12-03
HYBRID GLYCOPHORIN AND RED BLOOD CELL ANTIGEN GENOTYPING IN AMERICAN BLOOD DONORS WITH MIA PHENOTYPE
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Background: The Mi-antigen is carried on six different hybrid glycoporphins in the Miltenberger Subsystem. The GP.Mur (Mi.III) glycoporphin with the Mi+ phenotype is relatively common in the Southeast Asian populations. Antibodies against the hybrid glycoporphins can cause both hemolytic transfusion reactions and hemolytic disease of the fetus and newborn. Cross-reactivity of the epitopes among different classes in the Miltenberger Subsystem makes the precise identification of the glycoporphins using serology challenging.

Aims: To determine the hybrid glycoporphin distribution in serologically Mi+(−) Asian American blood donors using molecular techniques, as well as the red cell minor antigens in the same cohort.

Methods: A total of 4052 random Asian American blood donors primarily from the Gulf Coast Regional Blood Center (Houston, TX) have been screened by using the NOVACLONE® mouse monoclonal IgG typing reagent. The Mi+ (−) donors identified in the initial screening were confirmed serologically by using supernate from anti-Mi+ GAMA210 monoclonal IgG antibody. The Mur+(−) donors were identified by using anti-Mur 64D6 monoclonal IgM antibody, which were confirmed by using two polyclonal human antiserum specific for the Mi+ and Mur antigens. Genomic DNAs extracted from the Mi+(−) donors were amplified in the Polymerase Chain Reaction (PCR) using the GYP hybrid gene sequence specific primers (SSP). The hybrid glycoporphins were identified by hi-directional DNA sequencing. The frequencies of GP.Mur, GP.Bun, GYP.Vw and GP.Hut glycoporphins in the Mi+(−) cohort and among the donors were determined. The hybrid glycoporphin phenotyping between serology and molecular testing were compared. In addition, phenotypes for the 35 minor blood group antigens were determined by using the PreciseType® HEA Molecular beadChip Test. The genotypes and zygosity of the GYP.Mur/GYP.Bun alleles in the Mi+(−) donors were also determined by using the real time (RT) PCR method and the prototype beadChip assay.

Results: At the Gulf Coast Regional Blood Center, 236 Mi+(−) samples (5.82%) were identified by initial screening of 4052 Asian American donors using the anti-Mi+ NOVACLONE IgG typing reagent. At Immucor, only 215 Mi+(−) samples could be confirmed with both anti-Mi+ GAMA210 IgG and anti-Mur 64D6 IgM due to the condition of some samples that precluded serological testing. One discrepant result between the donor center and Immucor had been investigated by SSP-PCR, which indicated that one Mi+ sample was mistyped as Mi+(−) at the donor center. Genotyping of the 236 Mi+(−) samples showed that 91.10% (215/236), 6.36% (15/236), 0.85% (2/236) and 0.42% (1/236) were GYP.Mur, GYP.Bun, GYP.Vw and GYP.Hut with frequencies of 5.31% (215/4052), 0.37% (15/4052), 0.05% (2/4052) and 0.02% (1/4052), respectively, in the donor population. There was 99.53% (214/215) concordance between results from serology and GYP hybrid gene SSP-PCR coupled with sequence analysis. One GP.Vw sample was mistyped as Mur+(−) by using the anti-Mur 64D6 IgM antibody due to weak antibody reactivity [1]. The minor red cell antigen profiles in the 236 Mi+(−) donors were consistent with previously studies in Asian American donors. The hybrid glycoporphins identified in the prototype beadChip assay were found to be 100% concordant with genotyping by DNA sequencing.

Summary/Conclusions: The GP.Mur glycoporphin is the most frequent phenotype of the Miltenberger Subsystem in the Mi+(−) Asian American blood donors. This study provides an efficient process to characterize Mi+(−) donors using a combination of serological and molecular methods.

3B-S12-04
HYPERMETHYLATION OF CPG ISLAND IN THE ABO GENE LEAD TO AN ABW PHENOTYPE DONOR
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Background: The ABO blood group system is highly important in clinical transfusion and transplantation medicine. Many of ABO subgroup have been discovered, which were caused by any mutation in the coding region or splicing site are known. However, rare donors with variant phenotype were reported due to the hypermethylation of CpG island.

Aims: This study aims to investigate the molecular basis of ABW gene in variant with serologic ABW blood group discrepancy.

Methods: The phenotype of ABO variants were typed with standard serologic method. The full coding regions of ABO gene for these variants were amplified with polymerase chain reaction and then directly sequenced. The level of methylation in ABO gene promoter CpG island was analyzed by bisulfite sequencing method. The ratio of each CpG site methylation was analyzed by BiQ Analyzer software. Then, the data analysis was performed by GraphPad Prism5.

Results: No mutations in the coding region or splicing site were found in the individuals with ABO subtypes. Compared with methylation level of each variant and the normal samples, hypermethylation of CpG island was existed in one case of ABw phenotype. 40.3% of the CpG sites were methylation through the region. Both the amount of CpG site and the average ratio of CpG methylation extended from the region −700 to 200 showed significant difference with the other individuals (P < 0.05).

Summary/Conclusions: The hypermethylation located in the proximal promoter region was crucial for elucidating the mechanism of variant phenotype donor and offering useful information in blood transfusion.

This work was supported by the Science Research Foundation of Zhejiang Province (LY12JF08001, LY17H080003), the Medical Science Research Foundation of Zhejiang Province (2016RCB006, 2017KY15, 2017C31319).

3B-S12-05
INVESTIGATION OF HLA-DPB1 MATCHING STATUS IN UNRELATED HEMATOPOIETIC STEM CELL TRANSPLANTATION BY EPIPOE-SPECIFIC TYPING METHOD
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Background: Allogeneic hematopoietic stem cell transplantation (HSCT) is a well-established treatment for advanced hematologic malignancies. The impact of HLA-DPB1 match after HSCT remains controversial. HLA-DPB1 match between donor and recipient can be analyzed at the allelic level, single amino-acid level or classified as permissive/non permissive HLA-DPB1 disparities. The epitope-specific typing (EST) method for HLA-DPB1 is an innovative protocol for rapid, targeted detection of DPB1 TCE disparities.

Aims: To analyze the matching status of HLA-DPB1 in unrelated Hematopoietic stem cell transplantation by the epitope-specific typing method.

Methods: Two pairs of specific primers as previously reported (EST-AD-F: CCAGC-GAAGATACCGTGC; EST-AD-R: TCGGCCACTCCGGCTC; EST-CE-F: GGGCGGCTGATGAGGAC; EST-CE-R: TCCGATTTGGTCTGACAT) were applied to amplify the high variable region sequences of HLA-DPB1 for 106 samples (53 pairs of unrelated donor-recipient) and the HGH gene was used as an internal control in both reactions. The amplification products were detected by 2% agarose gel electrophoresis and the genotype was assigned. All the samples were detected simultaneously by PCR-SBT method in parallel so as to evaluate the accuracy of the EST method.

Results: The two specific target fragments were observed with the PCR amplification, and good results were obtained after directly electropherogram. Among 106 samples (53 pairs of unrelated donor-recipient), 71 individuals were negative for both of the two primers, 6 individuals were positive for both of the two primers, 18 individuals were only positive for EST-AD primers,23 individuals was only positive for EST-CE primers. The distribution between donor and recipient is no evident different according to the results of Chi-square test (P > 0.05). Of 53 pairs detected in our study, 36 pairs were matched and the other mismatched, which is identical to the result of PCR-SBT method as previously reported.

Summary/Conclusions: The epitope-specific typing method for HLA-DPB1 is not only low-cost and timesaving but also reliable for large-scale retrospective clinical studies of HLA-DPB1 in unrelated hematopoietic stem cell transplantation. This work was sponsored by National Science Foundation of China (81401732), Zhejiang Provincial Program for the Cultivation of High-Level Innovative Health Talents, and medical science and technology foundation of Zhejiang province (2013RCB003 and 2013RCA009).
**Immunohaematology – Red Cell Genetics**

**JC-S13-01**

**A BROAD UTILIZATION OF NEXT-GENERATION SEQUENCING FOR RED BLOOD CELL GENOTYPING TO SOLVE PHASING, GENE ARRANGEMENTS AND COMPLEX SEROLOGY FINDINGS**

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**Background:** Red Blood Cell genotyping has been developed to predict phenotypes and to reduce alloimmunization in transfusion. It also provides distinguish information for serology complications. ABO subtypes, RH variants and Mittenberger series are most frequent serological complications seen among blood donors in our center, along with para-Bombay and JK nulls. Due to the vast variety of the genetic changes may be presenting, a platform capable of valid genotyping is desired. With the advances in Next-Generation Sequencing (NGS) and bioinformatics analysis, NGS is now the ideal platform for high-throughput, accurate, extensive and rapid genotyping.

**Aims:** Utilize next-generation sequencing result from customized panel for RBC blood group gene to determine genotypes and to solve complex serology findings.

**Methods:** Genotyping: A probe-based capture panel targeting blood group genes associated with 15 clinically relevant blood group systems including ABO, RH, MNS, Duffy and Kidd were tested. The enriched DNA was sequenced on Illumina MiSeq platform to generate 300 bp paired-end reads. RBC genotype is determined after bioinformatics analysis for SNVs, CNVs, SVs and phasing is introduced to reduce ambiguities between alleles for ABO subtypes.

Phenotyping: RBC antigen typing with Bio-Rad iD system for ABO, RH, KEL, MN, FY, JK, LE, LU, DI and in house anti-sera for “Mi” with gel test. Also ABO subtyping with ad/el or saliva testing, weak D testing was applied when necessary.

**Results:** A highly accuracy genotyping result from NGS is obtained (99.3%), including complex cases resolutions. Haplotyping can be achieved with sequenced reads phasing to determine ABO heterogeneity, read depths from RH, KHCIE can be used to determine the zygosity of RH and hybrid BHD-RHCE complex cases. D variants are determined and help classified Del from D negatives. Serology inconclusive Mittenberger series are distinguished through NGS genotyping as GP.Hut, GP.Vu or GP.Mar resulted from gene rearrangement. However, with blood group genes that produce transferase but not antigen itself, such as P1PK or Lewis system, the prediction accuracy yield lower than other blood groups.

**Conclusions:** We set up a customized NGS panel for blood group system prediction, established an automatic analysis pipeline. Both open source bioinformatics tools and in house developed scripts allow us to detect antigen determine SNPs, potential CNVs, SVs with gene hybridization, low percentage mosaicism and also novel SNVs for possible gene expression alteration. We are confident to validate NGS genotype result having high concordance with phenotype data and utilize it to solve complex cases.

**JC-S13-02**

Abstract has been withdrawn

**JC-S13-03**

**MOLECULAR GENETIC ANALYSIS OF PARA-BOMBAY PHENOTYPE REVEALING A NOVEL ALLELE IN THE FUT1 GENE**

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**Background:** The para-Bombay phenotype has a very low frequency in world population. The para-Bombay phenotype is characterized by the absence of weak expression of ABH antigens on red blood cells, but ABH substances are present in saliva. The underlying molecular basis is most commonly a mutated FUT1 gene present with or without an active FUT2 gene.

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Aims: In this study, Samples from 15 Chinese individuals serologically typed as para-Bombay were investigated. Among these, a novel FUT1 mutation was identified.

Methods: Standard serologic techniques were used. Genetic mutations of FUT1 and FUT2 genes were analyzed by DNA sequencing. The haplotypes of FUT1 were sequenced prior clone the genes into T vector.

Results: Five h alleles were observed from 15 para-Bombay phenotype probands, i.e. h1 [nt547-552aag], h2 [nt880-882aat], h3 [nt658c-t] and hnew [nt651c-t]. Seven FUT1 genotypes, i.e. h2/h3 [761 = 4], h1/h7 [658 = 1], h2/h2 [n = 1], h2/hx [n = 1], h2/hxw [n = 1] and h3/hxw [n = 1] and three functional FUT2 genotypes, i.e. Se[179]Se[175] (n = 10) and Se[179]Se[178] (n = 1) were identified in 15 probands.

Sequences/Genes: non-functional allele of FUT1 [661 C>A, Arg >Gly] was identified. Our data add to the growing database of mutations in the FUT1 gene and confirm previous reports regarding molecular analysis for para-Bombay phenotype.


**JC-S13-04**

IDENTIFICATION OF A RHAG*(R191Q) ALLELE ASSOCIATED WITH A WEAK RH AND NORMAL RHCE PHENOTYPE

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Background: The molecular background of majority of the D variant phenotypes are missense mutations, insertions, deletions in the RH gene, or RHD-CE-D hybrid alleles. In rare cases, mutations in genes encoding proteins that are required for proper membrane expression, such as RHAG and ANK1, can also lead to absence or weakened expression of Rh antigens.

Aims: To unravel the molecular basis of weak RH expression in a Chinese blood donor.

Methods: A blood sample with D variant phenotype was collected from the Guangzhou Blood Center. RH serologic typing was performed using two monoclonal anti-D reagents (clone Rum-1 and TH-28/MS-26) and a commercial panel of monoclonal anti-D reagents(D-Screen, Diagast) by a tube method. The RHCE antigens were typed using monoclonal antibodies (anti-C, MS-24 and P1 × 25513Gb; anti-C, MS-31; anti-E, MS-25b/Ms90b; anti-e, MS-16/MS-21/MS-63 and P3GDS12/MS563). The RHD and RHCE genotypes were analyzed by the developed RH multiplex ligation-dependent probe amplification (RH-MLP) assay; all 10 coding exons and promoter of the RHD gene were amplified and analyzed by direct sequencing. A customized Ampligel panel was used for next generation sequencing (NGS) of all exons, flankng introns regions and untranslated regions of 10 genes including RHAG and ANK1 in this donor. DNA preparation and sequencing were performed on the Ion S5 sequencer system (Thermo Fisher Scientific) according to the manufacturer’s instructions. Bioinformatics analysis was performed using Torrent Suite Software in combination with resources such as the Human Gene Mutation Database (HGMD), ClinVar and Pubmed.

Results: The donor was identified with a weak D phenotype but a normal CCee phe-
notype. Through the hemovigilance activity, we understood that TR-GVHD is not a rare event in Japan, which led us to the quick implementation of almost universal X-irradiation of cellular products. We were also able to verify the mechanism of anaphylactic shock caused by anti-haptoglobin antibody present in the blood of transfused patient. Hemovigilance also includes the function of blood donor vigilance where adverse reactions occurring on blood donors during or after blood donation are collected and analyzed. It led us to implement a muscle tension exercise to decrease the rate of vasovagal reactions or mitigate the reactions. One of the drawbacks of JC hemovigilance system, however, is that cases of medi-
al malpractice or near miss case such as incorrect blood transfusion or major mis-
tmatch transfusion are hardly reported, which is the limitation of the voluntary reporting system. Although intense collaboration between blood center and medical facilities is essential in this regard, a strong leadership by national transfusion society or new legislative measures are needed to establish comprehensive national hemovigilance system.

Haemovigilance (HV) is a continuous process of data collection and analysis of transfusion-related adverse events and errors (AR/IE) in order to investigate their causes and outcomes, and prevent their occurrence or recurrence. HV plays an essential role in ensuring the safety of donors and recipients with regard to blood transfusions. HV systems have been implemented effectively in most of high-income countries throughout the world, however, there has been not a functional HV system

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in China, either national or regional. By 2013, the first guideline on HV in China was released by the blood quality management committee of Chinese Society of Blood Transfusion (CSBT), and revised in 2015. For blood establishments and hospitals looking for help with setting up new plans or further improving blood transfusion safety, the guideline provides ample information on definitions, methodologies, and documentation protocols. Based on the guideline, a pilot program of transfusion reactions report was developed in Shanghai, which is a passive reporting model, but in spite of the delays and limits of the data, the program provides useful information to address a variety of questions in transfusion practices. HV is also considered to be used for other important objectives, such as the training of transfusion practitioners, the implementation of patient blood management (PBM) and the development of clinical guidelines. With the integration of HV into the existing expert symposiums and education courses in the past few years, hundreds and thousands clinician and blood bank practitioner got training and the importance of HV was recognized widely, and the principles of non-punitive principle and learning from errors. In 2017, the working party on haemovigilance of CSBT was set up, which is a milestone for the progress of HV in China. Through the working party, we can study the practices of antecedent countries and learning their experiences, by formulating policies, evaluating modes and mechanisms, compiling standards and guidelines, improving information management and standardization from one region to the other, to establish a national HV systems step by step in China.

3C-S14-03
HAEMOVIGILANCE IN JIANGSU PROVINCE OF CHINA: PRACTICE OF ESTABLISHING A WIDE AREA HAEMOVIGILANCE NETWORK

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In 2016, the WHO Global Database on Blood Safety reported that national haemovigilance (HV) system had been established in 70 countries, among which 38 countries were members of the International Haemovigilance network by the end of August 2017. In China, Haemovigilance is still in the early stage except for 2 HV systems in Hong Kong and Taiwan, the wide area haemovigilance network (HWAN) of whole journey and two-way tracking of transfusion information has not been established in mainland China. So it is difficult to systematically report and intervent transfusion adverse events between blood services and hospitals at Multi-city-level. Therefore establishing a regional HV system that covers the entire transfusion chain is necessary to ensure the safety and supply of blood. To explore, build and operate an exemplary HWAN based on cloud technologies, that covers the entire transfusion chain and to realize transfusion information control, sharing, exchange and statistical analysis from blood donors to recipients in the whole blood transfusion chain, and to monitor, intervene and manage effectively the transfusion adverse events. The HWAN software and a standardized transfusion database were developed under the latest country laws & regulations, the existing international standards, the HWAN information technology standard, data element standard and basic function criteria. The data of transfusion chain and other public platform were collected and transfusion information control, sharing, exchange and statistical analysis were realized by the application of the Middleware Technology combined with manual reporting way. Transfusion adverse events were reported, analyzed and intervened by establishing a reporting and analysis system for transfusion adverse events, an unified procedure for their early warning, reporting and disposal, as well as an assessment method of prevention/correction measures. The warning information and disposal advice were immediately issued and an efficient emergency response system was built through the SaaS services portal which linked together the relevant blood services, medical institutions and management departments within the scope of HWAN. The pilot HV work was designed and carried out in 6 representative blood centers, central blood station, basic-level blood station, secondary hospitals and tertiary hospitals of three cities of Jiangsu province, and an exemplary HWAN that covers the entire transfusion chain has been explored. Jiangsu’s HV cloud in China’s first regional HV network, which can realize bidirectional vein-to-vein monitoring and intervention, encourage joint activities between the members of transfusion chain at higher level and wider range, provide reference to ensure the blood supply quality safety, appropriate use of blood resources, and improve the response capability in blood emergency.

3C-S14-04
DONOR HAEMOVIGILANCE IN SINGAPORE

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Donor Haemovigilance is a surveillance process to monitor the undesirable events during and after blood or blood components donations. In Singapore, we started to collect data on bruising and haematoma rates which was used to measure staff performance since 2003. A more comprehensive donor haemovigilant programme was set up in 2007. All adverse events were captured and collated. For the past 10 years, the haemovigilance rate for whole blood donation was about 2-3% per year. The main adverse event was vasovagal reaction, and mostly affecting the new young donors. The haemovigilance rate for apheresis donation was lower (0.7-1.7%). The lower adverse reaction rate for apheresis donation could be due to apheresis donors were all frequent donors. Most of the vasovagal reaction were mild to moderate (~99%) according to the ISBT Donor Haemovigilance Workgroup definition.

3C-S14-05
INTRODUCTION OF THE KOREAN HEMOVIGILANCE SYSTEM

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Background: The first regulation on haemovigilance in South Korea was first established in 1999 by the Blood Management Act. The head of medical institutions must report specific transfusion reactions (death, disability, requirement of hospitalization, transfusion-transmitted infection) to the Ministry of Health and Welfare within 15 days of confirmation. The purpose of this act was mainly focused on management of transfusion-transmitted infections.

Aims: A more general form of hemovigilance system was needed for surveillance on the transfusion chain.

Methods: A research funded by the Korea Centers for Disease Control and Prevention was initiated in 2007 for development of the hemovigilance system. Review on hemovigilance systems of other countries and development of draft report forms were proceeded on the first year. Pilot operation of the system with 46 participating institutions was conducted during 2008-2009 and a website for reporting was developed during this period.

Results: The system was formally launched in a nationwide scale in 2010. It is supported by the Korean Ministry of Health and Welfare but is independently operated by the Korean Society of Blood Transfusion (KSBT). Although participation and reporting is voluntary, it is included in the accreditation checklist by the Korea Institute for Healthcare Accreditation and Assessment for Certification in Laboratory Excellence by the Laboratory Medicine Foundation. Participation is also recommended for institutions to be eligible for receiving blood management fee. These requirements have led to a significant increase in the number of participating institutions. Hemovigilance correspondents or blood bank directors report near-misses, incidents, and all types of adverse transfusion reactions. Reports can be sent by email but online reporting via the website is generally recommended. Explanatory meetings are held annually for participating institutions. Categories of adverse events and their severity were revised according to the definition by the ISBT Working Party on Hemovigilance and a simplified algorithm for discriminating acute adverse reactions was developed in 2015-2016. Imputability grading was included in the report operation system but is currently excluded. Annual reports in Korean language can be accessed via the website. Among 215 participating hospitals, 169 reported 1,375 adverse events during the fiscal year 2016. The majority was adverse reaction without incident (97.5%), followed by near miss (2.2%), incident (0.2%), and adverse reaction with incident (0.1%). Among 3,293 cases of adverse reactions, febrile non-hemolytic transfusion reaction (54.1%) and allergic reaction (24.9%) accounted for most of them. Most of the adverse reactions were non-severe (85.1%), and red cells (69.9%) were the most frequently related blood component.

Conclusions: A government-supported hemovigilance system was introduced in Korea from 2007. We have successfully operated the system for ten years including a two-year pilot study and gained substantial increase in the number of cases reported. We hope to further enhance the system qualitatively regarding case validation and standardization of case reporting.
ROLE OF CD36 IN IMMUNE THROMBOCYTOPENIA AMONG ASIAN POPULATION
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CD36 (GPIV, Naka) belongs to the class B scavenger receptor family, which is a
ligand for fibronectin, which is typically expressed on platelets and monocytes and type II lacking of CD36 on monocytes but not on platelets. CD36 deficiency on platelets is more frequent in Asians (about 3–11%) and Africans (about 8%) than in white people (0.4%). In south of China, the frequency of CD36 deficiency on platelets is about 2% (4.8% in Guangzhou; 2.16% in Shanghai), however, a little bit higher in Guangxi (4.13%). Meanwhile, more than 30 mutations underlying CD36 deficiency have been described in Asian population. 1228–1239delATTGGCCATT, 329–330delAC and C1516T seem to be the only mutations responsible for CD36 deficiency in Guangdong population. In contrast, C268T, 849insA, 329–330delAC and 1228–1239delATTGGCCATT are the most common mutations in Japan. Recent data indicated that more than 0.5% of individuals with CD36 type I deficiency may be at risk of developing anti-CD36 antibodies after receiving transfusions or during pregnancy in China and Japan. Since the first case of platelet transfusion refractoriness caused by anti-Naka antibodies was reported in a Japanese patient, the impact of anti-CD36 antibodies has been reported in several clinical conditions of immune-mediated thrombocytopenia including fetal/neonatal alloimmunity thrombocytopenia (FNAIT), post-transfusion purpura (PTP) and platelet-transfusion refractoriness (PTR) as well as transfusion related acute lung injury (TRALI). Compared to other platelet antibodies against HPA systems, anti-CD36 antibodies seem to be more frequently found in PTR and FNAIT cases among Chinese population. Recently, two cases of FNAIT and five PTR cases induced by anti-Naka antibodies were found in Guangzhou Blood Centre. However, the incidence of thrombocytopenia caused by anti-CD36 antibodies in Guangxi (four PTR and six FNAIT) is higher than other regions of China, which may be associated with the high frequency of CD36 deficiency. For the treatment of thrombocytopenia caused anti-CD36 antibodies, transfusion with CD36-null platelets is necessary to improve or prevent bleeding. Therefore, a donor registry of CD36-null donors should be established for the treatment of immune mediated bleeding disorder caused by anti-CD36 antibodies. Furthermore, testing of anti-CD36 antibodies should be considered in immune mediated thrombocytopenia, and probably in suspected TRALI as well. To improve the treatment of these disorders, further studies on the pathomechanism of anti-CD36 mediated immune disorders is necessary.

A CLINICAL TRIAL OF FROZEN PLATELETS
DC Marks1, 2, L Johnson1 and MC Read3
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Introduction: Platelets have a short shelf life (5 days) and up to 20% of platelet units may be discarded due to expiry. Smaller Australian hospitals often cannot justify keeping many (or even any) platelet units on site, and cryopreserved platelets may alleviate this problem. A single controlled clinical trial of cryopreserved platelets in cardiac surgery patients has previously shown that transfusion of cryopreserved platelets was associated with less bleeding and fewer red cell transfusions, with no adverse effects. Before cryopreserved platelets can be approved for civilian use, more information regarding their efficacy, cost-effectiveness, and safety is required. Therefore a pilot clinical trial is being conducted to demonstrate the effectiveness and feasibility of using cryopreserved platelets for the management of post-surgical bleeding, to inform a future definitive trial.

Methods: Cryopreserved vs liquid platelets for surgical bleeding (CLIP) is a multi-site, blinded randomised controlled effectiveness trial comparing cryopreserved platelets to liquid-stored platelets. Cardiac surgery patients at high risk of perioperative bleeding are identified using a validated scoring method. Consented patients are randomised to receive either cryopreserved or conventional platelets. Platelets are cryopreserved at the Australian Red Cross Blood Service and shipped to hospital sites. When required, the platelets are thawed and reconstituted in thawed FFP immediately prior to transfusion. Outcomes include acceptability to clinicians, a sufficient trend towards greater efficacy in reducing blood loss and transfusion requirements, the rate of adverse effects, incidence of venous thromboembolism, cost per patient, length of ICU stay and 28-day mortality.

Results: To date 107 patients in four metropolitan tertiary hospitals have been randomised. Of these, 40 patients have been transfused. No adverse events have been reported to date, and no reported transfusion delays. One of the challenges has been the low overall conversion rate from randomisation to transfusion (37%). Access to monitored –80°C freezer storage has also been challenging. As thawing platelets is not a routine blood banking activity, training large numbers of hospital blood bank staff in this process and maintaining their competency over the duration of the trial was also demanding.

Conclusions: There have been many challenges associated with introduction of a novel blood component in a clinical trial, all of which have been overcome. Upon completion data will be analysed, and together with other learnings from the trial, will be used to inform the design and sample size calculations for a larger definitive trial.

MULTIFACETED REGENERATIVE LIVES OF EXPIRED PLATELETS
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There is great interest in using expired (5–10 days) platelet concentrates, no longer suitable for transfusion due to bacterial contamination concerns, as source material for producing human platelet lysates (hPL) for cell therapy procedures and dedicated regenerative medicine applications. In conclusion there is a strong scientific rationale for making optimal use of expired platelets available in blood establishments are typically frozen at °C freezer storage has also been challenging. As thawing platelets is not a routine blood banking activity, training large numbers of hospital blood bank staff in this process and maintaining their competency over the duration of the trial was also demanding.

Conclusions: There have been many challenges associated with introduction of a novel blood component in a clinical trial, all of which have been overcome. Upon completion data will be analysed, and together with other learnings from the trial, will be used to inform the design and sample size calculations for a larger definitive trial.

MULTIFACETED REGENERATIVE LIVES OF EXPIRED PLATELETS
T Burnouf
1Graduate Institute of Biomedical Materials and Tissue Engineering, Taipei Medical University, Taipei, Taiwan, Republic of China

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TTID – Screening

4A-S15-01
BLOOD SCREENING STRATEGY IN INDONESIA
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Indonesia is the biggest archipelago country in Asia with more than 400 Blood Centers and has been classified into medium to high endemic of hepatitis B country. The safety of blood is a big challenge due to geographic and infrastructure difficulties and budget limitation for blood services.

To describe the evolution of safety of blood towards transfusion transmitted infections (TTIs) in Indonesia.

Analyzing the data of blood screening on TTIs in Indonesia from 2006 to 2015 to describe the impact of policy and regulations on the improvement of blood safety in Indonesia. The Government Regulation followed by the Ministry of Health Decrees on Blood Services have been developed since 2009 to improve a quality of blood services in Indonesia. Those regulations directed more stringent donor selection and blood screening towards antigen and/or antibody of HIV, hepatitis B virus, syphilis and hepatitis C virus on all donated blood either by Rapid Test or ELISA or Chemiluminescence methods. While blood screening for malaria was only run in the endemic areas using a rapid test. Moreover, to increase the safety of blood, Nucleic Acid Test (NAT) was added in 12 Blood Centers.

There was a significant decrease of HBV seropositivity (from 2.13 to 1.4%) and relatively constant of HIV seropositivity (0.4 to 0.59%) which possibly due to better donor selection. However, the seropositivity of HIV was fluctuate increased from 0.02 to 0.27% as well as syphilis from 0.37 to 0.86%. The increase of HIV seropositivity could be due to the usage of four generation of ELISA or Chemiluminescence methods that were known to be more sensitive.

Implementation of more stringent donor selection and sensitive blood screening methods proved that government regulations improved blood safety in Indonesia. However, the variation of blood screening methods used, need to be reduced to standardize blood safety. Consolidation of blood screening may be one strategy to solve this problem, although some part of Indonesia has difficulty in geography and infrastructure.

4A-S15-02
A PILOT SEROSURVEY OF BABESIA MICROTI IN CHINESE BLOOD DONORS
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Background: Babesia spp. are tick-borne, intraerythrocytic protozoan parasites that can cause disease (i.e., babesiosis) in humans. Babesiosis is an emerging transfusion-transmissible infection, usually attributable to infection with Babesia microti. B. microti has the ability to establish asymptomatic, infection that can persist for months in a potentially endemic area: a potentially endemic area:

The study was to determine the occurrence rate of Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; Samples that were negative for Babesia microti-infected hamster blood; 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**4A-S15-05**

**COMPARING ASSAY PERFORMANCE OF ELISA AND ELECTRO-CHEMILUMINESCENCE IMMUNOASSAY (ECLIA) IN DETECTING TREPONEMA PALLIDUM SPECIFIC ANTIBOIDS**

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Background: Syphilis is a major concern to transfusion safety with increasing incidence in several countries including China. Therefore, it is very important to search for a screening test with sufficient sensitivity and specificity in syphilis diagnosis. ELISA is a traditional assay used by blood banks in China to screen serum for the presence of Treponema pallidum (TP) specific antibodies. In recent years, electro-chemiluminescence immunoassays (ECLIA) have been used for the detection of serum total antibodies to TP; However, research on the consistency of the performance of TP detection by ELISA and ECLIA are limited.

Aims: To evaluate the performance of ECLIA for TP specific antibodies detection and its comparison to ELISA.

Methods: A total of 1337 serum samples from 16 blood bank centers of China were included. 670 anti-TP reactive samples were served as positive control and 667 samples with elevated ALT levels and non-reactive to anti-TP were considered as negative control. All of these samples were tested with one ECLIA test and eight commercially available ELISA tests (1 to 8). Samples showing consistent results among all of these assays would be considered as either positive or negative. Discrepant results were further confirmed by Western blot (WB) or TP particle agglutination assay (TPPA) and any of these two tests with a positive result, would be considered as positive.

Results: Excluding 14 indeterminate results, in the 1323 samples, 272 plasma samples had discrepant results between ECLIA and ELISA assays. The TPPA and WB analysis showed that in the discrepant samples the consistency rate of ECLIA and confirmatory test was significantly higher than that of any ELISA test and confirmatory test (ECLIA: 76.84% vs 8 ELISA: range 19.4%-33.33%, P < 0.01). Consistency analysis showed that Kappa coefficient between ECLIA and confirmatory test (0.917) was higher than that between any ELISA test and confirmatory test (range 0.767-0.891). Further analysis showed that the false-negative rate of ECLIA was similar to any ELISA assay (P > 0.05), but the false-positive rate of ECLIA (4.72%) was lower than that of most ELISAs (6 ELISAs: range 11.66%-69.99%, P < 0.05) and similar to the other two ELISAs (ELISA 3: 5.01%, P > 0.05; ELISA 5: 4.98%, P > 0.05). The area under the receiver operating characteristic curve (AUC) of ECLIA was significantly higher than that of 6 ELISAs (ECLIA vs ELISA 1: 0.963 vs 0.940, P < 0.05; ELISA 2: 0.963 vs 0.954, P < 0.05; ELISA 3: 0.963 vs 0.939, P = 0.05; ELISA 5: 0.963 vs 0.932, P < 0.05; ELISA 6: 0.963 vs 0.949, P < 0.05; ELISA 7: 0.963 vs 0.940, P < 0.05), indicating a better detection efficiency for ECLIA. Although the sensitivity of ECLIA (97.4%) had no significant difference against most of the ELISA tests (ELISA 1: 98.4%, P = 0.130; ELISA 2: 97.8%, P = 0.06; ELISA-3: 98.6%, P = 0.114; ELISA 5: 98.0%, P = 0.603; ELISA 8: 97.9%, P = 0.752), the specificity of ECLIA (95.5%) was significantly higher than the ELISA tests (ELISA 1: 89.7%, P < 0.05; ELISA 2: 93.3%, P < 0.05; ELISA 3: 89.2%, P < 0.05; ELISA 5: 93.1%, P < 0.05; ELISA 8: 91.9%, P < 0.05). ECLIA also showed higher sensitivity than ELISA-6 (95.3%, P = 0.034) and ELISA-7 (93.7%, P = 0.001), but similar specificity (94.5%, P = 0.439 and 93.5%, P = 0.050).

Summary/Conclusions: Compared with ELISA, ECLIA is easy to use, automated with high throughput and more specific to detect antibodies to TP. In the future, ECLIA may be an alternative test with high sensitivity, and higher specificity to ELISA as a screening test for syphilis diagnosis in China.
Academy Session - The Transfusion Team: the role of the Transfusion Practitioner

4A-S16-01
THE ROLE OF THE TRANSFUSION PRACTITIONER IN THE MULTIDISCIPLINARY TEAM
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Transfusion and patient blood management (PBM) processes are complex; while transfusions can be lifesaving, equally there may be associated morbidity and mortality. The safety and PBM culture in Australia is propelled by obligations to comply with mandatory governance frameworks. These frameworks support appropriate use of blood/blood products, and that there are adequate levels of safety at all points on the vein to vein journey. A key to the success of blood management governance is the health service multidisciplinary Blood Management team/Governance Committee (BMC). Their structure depends on the size of the health service. Importantly, representation includes healthcare executive, clinical governance, and consumer, with the transfusion practitioner (TP) as a key resource. Other members include staff [medical/laboratory/nursing] from areas that regularly undertake transfusion and PBM activities, such as: perioperative suites, emergency departments, clinical wards, infusion centres, general practices, and laboratories.

Engagement with relevant healthcare stakeholders is important. The TPs skillset focuses on ‘staff and patient education, adverse events, transfusion governance and monitoring of transfusion practices within organisations…to ensure current clinical practices align with state, national, and international guidelines and standards.’ (Miller 2012) Benchmarking through key performance monitoring, and sharing of ideas at both a local and international level allows for system improvements, and ensures efficiency and safety is maintained. The TP, working in a multidisciplinary capacity across the clinical spectrum at all levels and specialties, is often seen as the driving force for change within the healthcare system in areas affecting blood transfusion and PBM.

In Australia, the TPs influence can be within an individual organization, across multiple sites, or health networks, in metropolitan or rural/regional areas. The TP conducts a critical role pulling together resources, promoting exchange of information, encouraging engagement and empowering colleagues to facilitate change. Highly developed communication skills assist the TP to engage the many different stakeholders and clinical environments. Successful PBM requires a coordinated approach to care across many specialties. Each clinical discipline has a role to play in the assessment and management of: pre-operative anaemia, bleeding and thrombosis risk, and tolerance of anaemia. The TP is often the key link between these clinicians, the patient, and the planning process.

For any multidisciplinary team to function effectively, collaboration is essential. Highly functional teams recognize knowledge and experience, and utilize each member’s skills to work together to deliver the best possible outcome for patients. Examples of working together include the development of protocols, education, auditing and review of compliance, and patient outcome. TPs often undertake haemovigilance activities, and work together to follow-up reactions, and act on any recommendations with support of the BMC.

There is growing body of literature available supporting multidisciplinary teams, and the TP role, in the implementation of PBM, and reducing unnecessary transfusions, and thus improving patient outcomes.

Conclusion: Effective transfusion and PBM practice requires a systematic cross-specialty approach to ensure success. The TP are the essential link in the multidisciplinary chain. However, they require strong support and leadership to potentely effect change and enhance practice.

Donation and Processing – Abstract Session

4A-S17-01
CELL-FREE NUCLEIC ACIDS IN BLOOD PRODUCTS MODULATE GENES INVOLVED IN INFLAMMATION
S Taleb1,2, D Tirefort1,2, S Waldvogel-Abramowski1,3 and O Preynat-Seauve1,2
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Background: Cell-free nucleic acids (CFNA) are present in human plasma. We recently described their presence in manufactured blood products eligible for transfusion but little is known about their biological activity on human cells. Previous experiments performed with peripheral mononuclear cells suggested that CFNA could modulate genes related to innate immunity.

Aims: The aim of this study is to investigate if macrophages, the key initiators of immune and chemotactic reactions of leucocytes during the inflammatory reaction, are also sensitive to CFNA.

Methods: Macrophages were produced through ‘in vitro’ exposure of monocytes to GM-CSF. They were then exposed to CFNA extracted from RBC, FFP and platelet concentrates (PC), respectively. A gene expression array analysis was performed.

Results: 976 genes were found to be significantly regulated (up regulation and down regulation) after CFNA exposure in all tested products (FFP and RBC and PC). 131 genes were regulated after exposure to RBC-CFNA and PC-CFNA. 118 genes were regulated after exposure to FFP-CFNA. 41 were shared between RBC-CFNA and PC-CFNA. 976 genes were found to be significantly regulated (up regulation and down regulation) after CFNA exposure in all tested products (FFP and RBC and PC).

Summary/Conclusions: CFNA present in blood products have a biological effect in ‘in vitro’ on macrophages, with regulations of genes involved in innate immunity and inflammatory response. Free nucleic acids are then identified as components of blood products possibly interfering with the recipients immune system. Thus, free nucleic acid can be considered as new potential candidate participating to some transfusion side effects.
4A-S17-02
THE MECHANISM OF ENZYMOLYSIS OF BLOOD GROUP A ANTIGEN WITH A-N-ACETYLGALACTOSAMINIDASE FROM ELIZABETHKINGIA Meningosepticum
H Gong1, Z Tan1, H Zhou1, X Zhang1, Y Tan1, S Li1, Q Luo3, S Ji1 and E Gong1
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Background: Alpha-N-acetylgalactosaminidase (NAGA) from Elizabethkingia meningosepticum is a hydrolase which can convert both group A1 RBCs (containing A1 antigen) and A2 RBCs (containing A antigen) to O RBCs. How does NAGA cleave both A antigen and complex A1 antigen, or NAGA is an exoglycosidase or a novel glycoside hydrolase having both endo and exo-glycosidase activity, which is a key scientific problem to be solved. In addition, the other scientific question to be answered is the safety of clinical application of A-ECO RBCs.
Aims: To reveal the mechanism of enzymolysis blood group A antigen with a-N-acetylgalactosaminidase from Elizabethkingia meningosepticum and evaluate the function and safety of these A-ECO RBCs in vitro.
Methods: The residual carbohydrate in A-ECO RBCs solution was purified by centrifugation, ethanol precipitation and Sevag method, and the carbohydrate type was determined by TLC, NMR, electrospray ionization mass spectrometry, infrared Spectroscopy and high performance gel permeation chromatography (HPGPC) analysis. The A-ECO RBCs were also typed by traditional typing in test tubes, gel column agglutination technology and fluorescence-activated cell sorting (FACS) analysis. The morphology of native and ECO RBC was observed by scanning electron microscopy. The function of A-ECO RBCs were evaluated by physiological and metabolic parameters, including osmotic fragility, erythrocyte deformation index, levels of 2,3-diphosphoglycerate, ATP, methemoglobin, free Na+, and free K+. Manual cross-matching test was applied to ensure blood compatibility.
Results: The RBC agglutination tests and FACS results showed that A RBCs were efficiently converted to O RBCs. The products of the oligosaccharides obtained from the enzymatic hydrolysis of A1 RBCs were confirmed as monosaccharide N-acetylgalactosamine. The FCAS results showed that the surface of A EC RBCs contains a large number of type 3H antigen. These data demonstrate that NAGA is an exoglycosidase. Functional analysis suggested that the conversion process had little impact on the physiological and metabolic parameters of the RBC. About 50% of group O and 35% of group B sera reacted with the A-ECO RBCs in a sensitive gel column cross-matching test.
Summary/Conclusions: This study revealed the mechanism of enzymolysis blood group A antigen with a-N-acetylgalactosaminidase, that is type 3 chain H antigens were generated. Cross matching test confirmed that the A-ECO RBCs still reacted with some group O and B sera, which may partly reflect the complexity of group A1 antigens. More research on the safety of A-ECO RBCs is necessary before the application of these RBCs in clinical transfusion.

4A-S17-04
THE EFFECTS OF STORED RED BLOOD CELLS ON DENDRITIC CELLS’ MIGRATION ABILITY, FUNCTION AND UNDERLYING MECHANISM
X Wang, Z Man, Q Zhou, Z Wang and L Zhan
Beijing Institute of Transfusion, Beijing, China
Background: The interactions between stored red blood cell (stored RBC) and immature dendritic cells (imDCs) involve that how the immune system identifies and clears the stored RBC and how stored RBC affects the function of immune system. Aims: To study above-mentioned interactions, the inflammation responses initiated by stored RBC, the maturation, migration ability and function of dendritic cells after co-incubulation were monitored as indicators to shed light on the specific correlations. Methods: We used C57BL/6J mice fresh RBC, stored RBC and PBS separately stimulated imDCs derived from mouse bone marrow at 37°C for 10 h with a low dose of LPS ex vivo. Co-culture supernatants were collected for batch analysis of cytokines and chemokine secretions by ELISA. DCs were then collected for phenotype analysis by flow cytometry and migration dynamics by bioluminescence imaging after adoptive transfusion, and the proliferation and activation of antigen-specific CD8 T cells elicited by DCs were also detected.
Results: The results showed that the expressions of costimulatory molecules CD40, CD80 and CD86 and chemokine receptors CCR7 on imDC treated by stored RBCs were significantly higher than those of fresh RBC. ImDCs treated by stored RBCs produced higher levels of pro-inflammatory cytokines IL-6, TNF-α, IL-12p70, IL-1β and chemokine MCP-1 than the fresh RBC pretreated group, as well as lower levels anti-inflammatory cytokines IL-10 expressions. After being injected subcutaneous or intravenous injection, the homing percentage and speed of DCs pretreated by stored RBCs to LNs were higher than the fresh RBC group. On the contrary, the proliferation, activation and IFN-γ secretion of antigen-specific CD8+ T cells in the stored RBC group was lower than the fresh RBC group.
Summary/Conclusions: These results demonstrated that although stored RBC promoted DC maturation, migration and homing, they did reduce the imDCs’ ability to cross-presentation and activate antigen-specific CTL. Further investigations suggested that the down-regulated expression of CD47 on stored RBC induced phagocytosis through interaction with the inhibitory immune receptor SIBPα expressed on imDCs compared with fresh RBC. Stored RBC also enhanced the production of ROS in the co-incubation system and proinflammatory cytokines secreted by imDCs, which promoted DCs’ maturation. The Rho/ROCK, PI3K/Akt and NF-κB signaling pathway were involved in stored RBC-induced dendritic cell cytoskeleton rearrangement, enhanced DCs’ motility ability, promoted the ability of DCs’ migration and homing to lymphoid tissue.
PLATELETS INHIBIT THE GROWTH OF STAPHYLOCOCCUS AUREUS BY DAMAGING BACTERIA STRUCTURE
1Xijing Hospital, Xi’an 2Chongming Medical School, Chongqing, China
Background: Platelets are classically used in the clinic to maintain hemostasis. Recent evidence has supported the important roles of platelets in host inflammatory and immune responses, and platelet-rich plasma has been shown to inhibit the growth of bacteria in vitro and in vivo. However, very few studies have shown platelets can inhibit bacterial growth directly, and the related mechanisms have not been elucidated.
Aims: Use washed platelets co-culturing with Staphylococcus aureus to find out whether platelets could display antibacterial effect directly.
Methods: Platelets from human peripheral blood were washed and purified, and then the washed platelets were co-cultured with Staphylococcus aureus in vitro, and the bacterial growth was evaluated. The transmission electron microscopy (TEM) was used to probe Staphylococcus aureus ultrastructure after co-cultured with or without platelets. In vivo study, fresh separated murine platelets were transfused to the Staphylococcus aureus infected mice to explore the antibacterial defense effect, while a platelet depletion murine model was administrated with Staphylococcus aureus infection directly. Histological section analysis and blood routine examination were used to evaluate the infection severity of mice.
Results: Platelets significantly inhibited the growth of Staphylococcus aureus when co-cultured in vitro, and the ultrastructure of Staphylococcus aureus was seriously damaged after co-cultured with platelets. And these antibacterial features were completely different from plasma. The murine Staphylococcus aureus infection model showed that depletion of platelet exacerbated the severity of infection, whereas transfusion of platelets alleviated infection.
Summary/Conclusions: Purified platelets inhibited the growth of Staphylococcus aureus directly and that platelets played an important role on antibacterial defense.

30 Abstracts

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Donor Management – Donor

4B-S18-01
MANAGEMENT OF BLOOD DONATION IN AN EMERGENCY SITUATION
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Background: The NRCS BTS was established in 1996 and assists responsibility to provide countrywide blood and blood products for the people of Nepal. The NRCS BTS consists of 10% blood collection centres in 72 districts across Nepal. The NRCS is the major provider of safe and secure blood and blood products for the people of Nepal, and it does so supporting a policy of 100% of voluntary non-remunerated blood donations.
Aims: The demand for blood and blood components has steadily risen each year since establishment. Last year 2016 Nationwide 236,799 units were collected and blood stock in all blood centres. Many of blood donors and organizers were listed in cue with request to donate blood. Many organizations and individuals were willingly supporting. There were insufficient blood stock but demand was less from all Hospitals. All Blood Centers provided free supply of blood and blood products to all earth quake victims for almost 1 month.
Summary/Conclusions: Many organizations requested for blood donation but as blood stock were managed in the centres and all were listed in cue. All Blood centres collected day to day blood from volunteer blood donors and all stakeholders. There were sufficient blood stock but demand was less from all Hospitals. All Blood Centers provided free supply of blood and blood products to all earth quake victims for almost 1 month.

A LINKAGE ANALYSIS BETWEEN SOCIAL ACTIVITIES AND VOLUNTARY BLOOD DONATION IN SHENZHEN
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Background: Shenzhen is the first city in China to start voluntary blood donation, and a city with planned blood donation, mutual blood donation, and blood management office. Voluntary blood donation was started since 1993 and it becomes the only way to donate blood in Shenzhen. From 1998, We fully met the clinical blood use for 19 consecutive years. Street voluntary blood donation is the main mode whereas collective blood donation is auxiliary. However, donation on street is strongly affected by weather conditions, especially in winter and summer. The insufficiency of blood supply occurs occasionally from time to time.
Aims: Street voluntary blood donation is a city with a history of 38 years and currently it becomes a super city with a population of more than 10 million. Many organizations and individuals were willing to support blood donation. Many of blood donors and organizers were listed in cue with request to donate blood whenever in need as could not let them donate as there were excess of blood stock in all blood centres.
Methods: Our strategy is by two ways: 1) To build more blood donation sites on streets; 2) to increase the intensity of the collective blood donation. We took the long-term activities of collective blood donation with “the red action” in winter whiles “blood month for angels in white” and “fueling life” in summer.
Results: After several years of practice, we have successfully overcome the blood insufficiency problem. In the past 5 years, top organizations with number of collective blood donors includes social charity organizations, universities, enterprises, civil servants, hospitals and so on. The ratio of collective voluntary blood donation increased from 11.6% in 2012 to 20% in 2016. These organizations believed that: voluntary blood donation is not only the responsibility for local blood bank, but also for whole society. A significant change in the mode of propaganda and recruitment of voluntary blood donation occurs in Shenzhen. The social organizations, such as the Shenzhen Lions Association, have been made firm contribution on propaganda and recruitment of voluntary blood donation. The participation of social organizations in different fields fully reflected the public welfare, sociality and universality of voluntary blood donation work.
Summary/Conclusions: In this analysis of our achievements, we can conclude the following reasons: 1) A substantial support by Shenzhen municipal government in the legislative, financial and other aspects. 2) We precede the blood donation insisting in two principles “voluntary and free”. In propaganda, we pay more attention to the humanitarian spirit of blood donors, humanity and the traditional morality. 3) Setting good examples by blood center employees. Employees in our blood center from the leadership to the general staff give regular blood donation. There are more than 50 people in our blood center who have won the nationwide voluntary blood donation Awards. 4) The harmonious environment in Shenzhen promotes the attention of all walks of life and actively participates in voluntary blood donation.
In summary, we have proved that our long-term adherence to the principle of “voluntary and free” is correct. Blood donation without material stimulation promoted the public image, and improved the sense of happiness and pride. More organizations join the teams for blood donation. It also promoted the progress of city’s civilization, and to ensure the sustainable development of voluntary blood donation in the future.
4B-S18-03
 EFFECT OF REGULAR PLATELETPHERESIS ON DONORS’ CALCIUM LEVEL AND BONE DENSITY IN NATIONAL BLOOD CENTRE, KUALA LUMPUR
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Background: Plateletpheresis is a process of selectively removing platelet from whole blood and returning the remainder to the donors. Citrate is used as the anti-coagulant to ensure the blood fluidity throughout the procedure. However, citrate chelates calcium and causes hypocalcaemia. Calcium is essential in bone remodelling. Chronic effect of frequent exposure to citrate anti-coagulant and hypocalcaemia state to donors’ bone density is not known.

Aims: The aim of this study is to investigate the effect of regular plateletpheresis on donors’ calcium level and their bone density status. The pre- and post- donation calcium levels were compared in regular plateletpheresis donors and compared between the groups of regular donors based on the frequency of donation.

Methods: Fifty plateletpheresis donors in National Blood Centre, Kuala Lumpur were selected to participate in this study from 15th January till 31st March 2016. Those donors were divided into two groups based on their number of plateletpheresis donations; donated less than 20 and more than 50 times. Each donor’s bone density status was measured through dual emission X-ray absorptiometry (DEXA) scan, followed by pre-sampling of liver function test (LFT), calcium and magnesium levels prior to plateletpheresis. A post-procedural blood sampling was also taken to measure for calcium and magnesium levels.

Results: This study included 50 patients with the median age of 35.0 years and 45.2 years respectively for plateletpheresis less than 20 and plateletpheresis more than 50. Majority of participants for both arms (96.0%) were male. Based on the race, most of the patients were Malays for both groups. There were improvements of the median corrected calcium and magnesium levels for plateletpheresis less than 20 group as compared to median for plateletpheresis more than 50 group. The level of albumin was higher for plateletpheresis less than 20 group with 96.0% of the cases had a normal DEXA scan findings. There was a significant difference in age (P = 0.006) between plateletpheresis less than 20 and plateletpheresis more than 50 cases. There were significant differences (P < 0.05) of magnesium level for both group at baseline and after plateletpheresis procedure. However, there were no significant differences based on gender (P = 0.1000), race (P = 0.413), the corrected calcium for both groups at baseline and after plateletpheresis procedure. There were no significant differences of albumin level (P = 0.167) and DEXA scan (P = 1.000) between plateletpheresis less than 20 and plateletpheresis more than 50.

Summary/Conclusions: This study showed that regular plateletpheresis had no effect on the calcium level and bone density among donors in both arms of the study. However, donors’ magnesium levels in both groups were affected. Addition of magnesium supplement to regular plateletpheresis donors on the other hand, need further investigations to ascertain that it may be of benefit to our regular plateletpheresis donors.

4B-S18-04
 ANALYSIS OF THE IRON STATUS OF MALE BLOOD DONORS AT FIRST-TIME AND ONE- TO FIVE-YEAR MAXIMAL (MAX.) DONATIONS IN TAIWAN
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Background: In Taiwan, up to 70% are repeated donors. Regular blood donors are at risk of iron deficiency but characteristics that predispose to this condition are poorly defined.

For detecting iron status, we used tests including ferritin, serum iron, and total iron-binding capacity (TIBC). Aims: Present study has determined the iron profile of regular voluntary blood donors to evaluate their iron status. The objective of this study is to investigate the iron status of first-time and regular male blood donors.

Methods: In Taiwan, the majority (99.1%) of blood donors are men; therefore, only men were included in our analysis. The whole blood donors selection criteria for men include age between 17 and 65 years old, body weight ≥50 kg, and hemoglobin ≥11.0 g/dL. Furthermore, the maximum amount of the whole blood donation is max. 1,500 ml. Pre-donation hemoglobin assessment was done by copper sulfate density method; serum ferritin, serum iron, and TIBC were tested by indirect ELISA (enzyme-linked immunosorbent assay). Transferrin saturation (%) was calculated as serum iron divided by TIBC. Low ferritin and low transferrin saturation were defined as serum ferritin level less than 23.9 ng/ml and transferrin saturations less than 20%, respectively. In this study, there were 111 first-time blood donors and 1,250 one- to five- year blood donors with max. donation. Two-sample t-test was used to compare group means, including ferritin level and transferrin saturation.

Results: The first-time blood donors had significantly higher ferritin level and transferrin saturation, compared with those of the one- to five-year blood donors with max. donation (ferritin: 31.7 vs 22.9 ng/ml; transferrin saturation: 36.3 vs 24.8-22.7%; both P<0.0001). In first-time blood donors, the prevalence of low ferritin and low transferrin saturation were 9.6% and 4.5%, respectively. One- to five-year blood donors with max. donation had high prevalence of low ferritin (32.9, 42.7, 42.9, 39.3 and 36.5%) and low transferrin saturation (37.2, 34.1, 39.9, 28.6 and 25.9%).

Summary/Conclusions: These findings showed that regular blood donors had lower ferritin and transferrin saturation but remained stationary. So, we think regular blood donors had better understanding of their iron status, and may seek some way to keep their health to keep donation. Early recognition and reversal of excessive iron loss may avoid symptomatic iron store depletion in blood donors and reduce volunteer loss due to iron deficiency (ID) anemia.

4B-S18-05
 THE EFFECT OF PSYCHOLOGICAL CARE ON ANXIETY OF BLOOD DONORS AMONG COLLEGE STUDENTS
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Background: Nowadays, psychological care plays an important role in our society. College students are the most major blood donation population. But still many of them are easy to be anxious or have adverse reaction at the time of or after blood donation because of the deficiency of medical knowledge. According to the research before, mental stress is the main cause of the adverse reaction. How to alleviate the anxiety of the blood donors among college students has become an important problem.

Aims: To investigate the effect of psychological care on anxiety of medical students and non-medical students, to explore the most appropriate mode of promotion and education for voluntary blood donation, to enhance the proportion of fixed blood donors from college blood donors, and to ensure blood supply to meet clinical use demand.

Methods: 200 students from a comprehensive university in Wuhan city, aged between 18 and 22, who volunteer to donate blood were randomly divided into observation group and control group, 100 students each group. In observation group, there are 58 medical students and 42 non-medical students. In control group, there are 52 medical major students and 48 non-medical major students. Control group was given routine blood donation nursing and observation group was given psychological care. Before and after the treatments on control group and observation group, the scores of Self-rating Anxiety Scale (SAS) were collected and the cases of adverse reaction were recorded respectively.

Results: In observation group, the SAS scores collected from medical students and non-medical students were significantly decreased after donations (P < 0.05), respectively. In control group, the SAS scores had no obvious change before and after donations (P > 0.05), whether of medical students and non-medical students. The incidence of adverse reaction of control group is higher than that of observation group (P < 0.05). The incidence of adverse reaction of non-medical major volunteers is higher than that of medical major volunteers in observation group and control group, respectively (P < 0.05). The incidence of adverse reaction of medical students in control group is higher than that of medical students in observation group (P > 0.05).

Summary/Conclusions: Psychological care can effectively alleviate the anxiety emotion of volunteers from universities, especially non-medical major students, so that most of the adverse reactions can be preventable. During donations, different methods of nursing including conventional care and psychological care should be chosen according to the actual situation. Timely, effective and holistic psychological care deserved the promotion to alleviate the anxiety emotion and the incidence of reverse reaction of volunteers. It is necessary to establish a scientific and effective mode of promotion, education and psychological counseling for voluntary blood donation.

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Plenary Session – TTID

PL4-01
PATHOGEN REDUCTION TECHNOLOGY
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Until recently, transfusion transmitted infection has been controlled through a com-
bination of donor selection and screening and laboratory testing. As more infections emerge, such testing is becoming increasingly complex and burdensome. An alternative approach is the use of pathogen reduction technology, either to replace, or to supplement testing. Methods for treatment of platelets and plasma are widely available. Additionally there is active development of methods for treatment of red blood cells or whole blood. These methods will be discussed, along with their benefits and potential areas of concern. Selected examples of successful implementation and use of the technology will be presented.

PL4-02
IMPACT OF VECTOR-BORNE INFECTIONS IN TTID
No abstract available

PL4-03
HIGH INCIDENCE OF HBV INFECTION REMAINS IN YOUNG CHINESE REPEAT BLOOD DONORS VACCINATED AT BIRTH
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Background: This study was to determine the incidence of HBV infection in the young generation of blood donors born after mandatory implementation of hepatitis B vaccination in 1992.

Methods: Repeat blood donors born between 1992 and 1997 who gave blood twice or more during the past three years were enrolled. Donors were tested for HBV markers of HBsAg, anti-HBc and anti-HBs by immunosassays (EIAs) and viral DNA by nucleic acid tests (NAT).

Results: 14,937 young repeat donors 18–23 years old were tested for HBsAg by EIAs (9/14937; 0.06%). HBV DNA yield was 1:1,494 [10/14,937] in repeat donors using UltraT NAT (limit of detection [LOD] 10.8 IU/mL), which further HBV DNA was detected in 1:392 (9/2448) anti-HBc+ repeat donors using UltraT Plus NAT (LOD

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3.4 IU/l) (Figure 1). Most cases were characterized as occult HBV infection (OBI). Of 14,937 repeat donors, 20.9% were anti-HBe positive, while approximately 50% of 12,024 donors were anti-HBs negative or with levels ≤100 IU/l. HBsAg+ or OBI strains were classified as wild-type of genotype B or C. Incident HBV infection in repeat donors was approximately 1:18.5 person-years (1.1%/y).

Conclusions: HBV vaccination appears largely protective of incident HBV infection, but undetectable or low anti-HBs level may allow incident new infections. A boost of hepatitis B vaccine for adolescent prior to age 18 and implementation of more sensitive NAT of blood donation are expected to improve HBV safety in blood transfusion.

Management and Organisation Organisational Issues

P-001
Abstract has been withdrawn

P-002
MAINTENANCE MEASURES OF RH (D) NEGATIVE BLOOD TYPE BY THE EMERGENCY BLOOD DONATION TEAM
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Background: In the past ten years, the blood supply of Rh (D) negative blood type red blood cells in Shijiazhuang region showed a rapid growth trend, and blood output increased by 1.18 times, and the number of corresponding blood donors increased by 1.25 times. By the end of 2013, only 2.5% of the blood donors who had been in contact with the center for more than 5 years had been active. This requires us to set up a contingent of rare blood groups that can keep in touch for a long time, and take reasonable maintenance measures to develop and expand.

Aims: To study the maintenance measures and comparative study of Rh (D) negative blood emergency blood donors in Shijiazhuang area, and to study more effective maintenance methods.

Methods: 1) use advanced information technology to communicate and publicize. The use of the central blood donation service platform SMS function, the first time to send care information. Make regular telephone visits to understand the recent health status and life status of donors. Set up a rare family of blood loving micro signals and public platform for donors to build a WeChat exchange of information, learning knowledge, self-help and mutual assistance platform. 2) warm and thoughtful blood donation service. To provide a full range of services at the center of blood donation to rare blood donors, blood donation recruitment department by special reception, notify the Department with the whole blood, provide considerate service for blood donors. And encourage blood donors to take part in the next blood donation with full enthusiasm. 3) love association activities, held a quarterly "rare blood type" knowledge of science lectures, regularly organized rare blood type emergency team archives combed, the newly added rare blood type files classified arrangement. 4) the development of blood donors. In a timely manner to the donors feedback on the examination and blood test information, put forward the corresponding suggestions and guidance, to meet the donor's physiological and psychological needs; to preach the preferential policies and blood compensation; clearly for clinical use value, enhance the sense of social identity and social responsibility; good scientific blood, reduce the loss rate of blood donors for the first time they will, efforts into the development of rare blood emergency blood donation team.

Results: Since the establishment of the rare blood type emergency team, the number of blood groups in the emergency ranks has been greatly increased by adopting the above-mentioned maintenance measures. The total number of rare blood type emergency teams grew from 334 in early 2014 to 561 in the first half of 2017, an increase of 72%. The annual total number of blood donors is also summed up in different blood banks.

P-003
Abstract has been withdrawn

P-004
HOW EFFECTIVELY THE DO THE 28 VOLUNTEER TEAMS WORK FOR BLOOD DONATION SERVICE IN GUANGDONG, CHINA?
J Tang, Y Fu, H Liang, Y Nie and W Zhang
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Background: Volunteer teams for blood donation often help blood banks to promote blood donation in China. Most of teams are funded by local government. It is reported that those teams with more volunteers may help recruit more blood donor. However, some research shows that the work effectiveness of volunteer teams is more significant to improve the promotion of blood donation. In China, blood donation has developed unevenly among different cities. The work effectiveness of volunteer team varies as well, which may related to their administration and management.

Methods: This is a secondary data analysis for blood donation service volunteer teams in Guangdong in 2014. The data included the volunteer names, date of estimation, and working location of each team, the number of registered volunteers and their working time. Volunteers who participated at least 3 times per year are recognized to be active volunteers. The Effectiveness Ratio of volunteer team (ER) is introduced. ER = the number of active volunteers/total number of volunteer registered.

Aims: 1)To find out whether the work effectiveness of volunteers is related to the recruitment of blood donor. 2)To learn how effectively the 28 volunteer teams work for blood donation service in Guangdong Province. 3)To search obstacles of volunteer management among 31 blood banks.

Results: The average ER is 41.93% in Guangdong Province in 2014. There were 13122 volunteers registered and only 5489 volunteers have participate donor recruitment. According to the size of ER, the ranking of 5 blood bank groups is Group 1 > Group 3 > Group 2 > Group 4 > Group 5. The annual total number of blood donors is also summed up in different blood banks, which recruited by the local volunteer teams. Blood banks are divided into 5 groups by the donor number (n): Group 1 (n ≥ 200,000), Group 2 (50,000 ≤ n<200,000), Group 3 (20,000 ≤ n<50,000), Group 4 (10,000n<20,000), Group 5 (n ≤10,000). The One Way ANOVA is conducted to access the association between ER and the annual total donor number in different blood banks.

Summary/Conclusions: The volunteer teams for blood donation service in Guangdong are working less effectively than the national average. Generally, more active volunteers help recruit more donors. However, medium size blood banks worked effectively (with higher ER), but recruited less blood donors than some other blood banks. It can be improved in volunteer management, organizational issues, recruiting methods and financial support.
P-006

THE ANALYSIS OF REFUND POLICY OF BLOOD EXPENSES BASED ON BIG DATA OF BLOOD COLLECTION AND TRANSFUSION IN HEBEI PROVINCE

W Li and J Yang
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Background: Since 2012, Hebei province on the basis of the information networking platform for blood collecting and supplying, realize the provincial blood costs in return and the discharge of blood charges reported, easing the "easy reimbursement of blood donation difficult" criticism [2]. But in the course of the actual operation of the blood charge return, blood donation to the donor body according to local blood donation to meet the regional standards to determine whether blood donors enjoy free blood conditions, the original purpose is to protect the blood donor's location and identity, and the subsequent confirmation of blood collection and transfusion system of Hebei province, the researchers identify the donor which is accordant with name and ID number by blood collection and transfusion system of Hebei province, and then using blood collection and transfusion system of Hebei province, the researchers identify the donor which is accordant with name and ID number by blood collection and transfusion system of Hebei province.

Methods: Based on the blood collection and transfusion system of Hebei province, the researchers indentify the donor which is accordant with name and ID number by blood collection and transfusion system of Hebei province.

Aims: To study the influence of different blood donation amount on the blood donation refund policy, and to investigate the compensation model of blood donation.

Results: The results show that the proportion of donors is higher in the region where the blood donation amount is more than 1000 ml, but in the region where the blood donation amount is less than 1000 ml, the compensation model is more advantageous for donors.

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P-007

APPLICATIONS AND CONSIDERATIONS ABOUT THE PROPORTION CONCEPT OF FIXED BLOOD DONORS

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Background: Fixed blood donors, refers to those who donated blood 3 times in total, and one time within the past one year, usually as an important index to evaluate the degree of stability of blood donors' team building and capability of blood support. "The Method of Commencing and Reward of Blood Donors (2014 Revision)" takes the local fixed donors to blood donors more than 50% as one of the important conditions of an advanced province (city). Based on the actual concern of fixed blood donor's population size or the capability of blood supply, domestic blood supply policies have different understanding and application, some calculate according to the ratio of the number of fixed blood donors. (hereafter referred to as the ratio of number of fixed blood donors), some calculate according to the ratio of person-time of fixed blood donors, and some calculate according to the ratio of volume of fixed blood donors. For now, the established group emergency blood recruitment. The group recruitment was a mode of the recruitment of blood collection and transfusion system of Hebei province, and then using blood collection and transfusion system of Hebei province, the researchers indentify the donor which is accordant with name and ID number by blood collection and transfusion system of Hebei province.

Methods: Extracting data from the formula definition of blood donation volume, number and person-time of donors during 2012 to 2016 to compare with the aggre-gation of each year to measure and calculate in proportion. In accordance with statistics, P < 0.05 shows a statistically significant difference.

Results: The blood collection volume was increasing every year, and the proportion of fixed donors, person-time and blood volume had been general uprends with different levels, which were inversely associated with the total growth.

Summary/Conclusions: The proportion of donors is inadequate to evaluate the capability of sufficient blood collecting. Instead, regarding the proportion of fixed donors number as a consideration to analyze the reservation utility and satisfaction degree of local demand would have more guiding significances.

P-008

A CASE OF INSPECTION ERROR CAUSED BY LABEL ERRORS OF BLOOD COLLECTING NURSE

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Background: January 2016, there was a case of errors in blood samples collected by blood collecting nurses, which resulted in invalid test results of 2 specimens. Because a number of people at the same time to donate blood on the blood car, in order to catch up with the progress of the work, the nurses violated the operation rules of blood collecting, and the last blood specimen of blood donors was taken before labeling, and didn't timely check. In addition, the day they went back to the blood station later, specimens received by the staff on duty, but the staff just counted the number, didn't check the specimens one by one. The next day, when the laboratory staff handover, found a specimen without label, so he asked blood collecting nurse. The nurse did not find the specimen was duplicated, and she thought she forgot to sign. Inspection personnel cut the pigtual catheter sample from the
blood bag for test. The result of specimen was initially rechecked is different from the result which was be tested again of the ABO blood type, the working part of the investigations found that covered the label. By reverse tracking each work link, then they found the blood collecting nurse made the label of 1 specimen repeated, and the other label of specimen was forgot. So it caused "one blood with two labels" and "one blood has no label". This paper aims to find the potential safety problems of the label of blood collecting and the work of handover in this blood station, and remind the staff to attach importance to the labeling, checking and handing over in the process of blood collection, and intensify the training of professional training, and take effective measures to prevent such incidents from happening again.

Aims: This paper discusses the causes of the errors of labeling, which caused by the blood collecting nurse, and the consequences of the examination errors, then puts forward some improvement measures to prevent such incidents from happening again.

Methods: According to analysis of the case that the nurse made the label mistake of the blood sample of 1 donors, resulting in detection result of two blood specimens was invalid, this paper further clarifies The importance of corresponding labeling and checking work in blood collection.

Results: By this case of error analysis, finding the human factors and objective factors for false label in the key link of blood collection and supply, putting forward the corresponding improvement measures according to the potential problem of quality and safety.

Summary/Conclusions: In actual work, we should increase the management of blood collecting staff and professional work training for blood collecting nurse, strict labeling management procedures, and strengthen the process control, eliminate the staff doesn’t have strong sense of responsibility, check carelessly and other causes of quality error in the process of blood collection, strengthen source control, ensure the safety of blood.

P-009 APPLICATION AND REVISION ON THE CONCEPT OF BLOOD DONATIONS PER THOUSAND

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Background: WHO regards donations per thousands as an important indicator to evaluate the level of blood supply in countries and regions. However, there are different understandings on the concept and measurement methods of donations per thousands interiorly, which will make different effects on the application of this concept in blood source development.

Aims: Based on the analysis of the population structure in Shijiazhuang, and the application results of the concept of blood donation in the collection and delivery of thousands of population is discussed. Combined with the development trend of blood transfusion, the reasonable development direction of blood donor recruitment is set up, and the blood collection efficiency is effectively improved.

Methods: The population of Shijiazhuang area in 2012–2015 was divided into two categories by setting the proper age as the boundary, the blood donation rate (%), the blood donation volume (L) and the blood donation rate (%) of the population in proper age were calculated. The population data were analyzed statistically, P < 0.05 was statistically significant.

Results: In recent years, the proportion of the population of the underage group and the elderly group in Shijiazhuang increased year by year, and the proportion of the population of the proper age group was declining, the number in the next few years continued to decrease.

Summary/Conclusions: Data shows significant differences in the ratio of the number of blood donors, person-time and the volume of blood donations per thousand, which is based on the resident population. The ratio among the number of donors, person-time and volume in the blood donation population of proper age could reflect the blood collection capacity of local blood banks, which is also suitable for the blood industry as a comparison between the indicators. The blood transfusion services should take the blood donation rate of the proper age group as the core indicators, and adopt the appropriate measures to improve the blood collection efficiency by increasing the frequency of blood donation and the 400 ml-sampling rate.

P-010 INTRODUCTION OF BLOOD INFORMATION MANAGEMENT SYSTEM USING SMART DEVICE

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Background: Korean Red Cross Blood Service Headquarters has added various confirmation procedures for ensuring the safety of blood donors and blood from blood collection sites. However, the nurses at the blood collection site needed frequent movements to handle various tasks, so they skipped some confirmation steps that can check the quality of blood only by desktop computers. Therefore, It has been emphasized to meet the needs for a new system that it is easy to carry and use while working, and it is possible to check and process the data such as ‘whether the blood donor is qualified to donate blood’, ‘whether the donor’s ID is identical with blood-bags used during blood collection’, and ‘the side effect records of the donor while collecting blood’.

Aims: Researchers examined the device that can meet ‘portability’ which enable staffs to carry and work with one hand, ‘functionality’ which enable staffs to process various important data in real time, and ‘high security’ for the importance of blood management works that process sensitive and important data including personal information.

Methods: In order to meet ‘portability’ and ‘functionality’ among the above three purposes, we have applied the smartphone to our work. We have selected specific models based on strict criteria and applied Mobile Device Management System (MDM), a security solution for mobile device management, to minimize part to manage, we also allow smartphone to utilize the LTE or 3G only, and limited the communication method by only the service through the VPN (Virtual Private Network) to secure the communication section.

Finally, an application related to blood collection task was developed with in-house method using the native development language, and distributed through MDM. In this way, security-authenticated infrastructure that only the authorized user and the authorized device can use the service using the encrypted end-to-end communication that has been checked for security has been established.

Results: Smart BIMS (Smart Blood Information Management System) system was applied to the blood collection site in mid-June 2013. Some of the functions of BIMS (Blood Information Management System) that were only available through full-browsing of desktop computer have applied to the first Smart BIMS, and have become possible without exception at all blood collecting sites. The nurses that adapted to a new working environment suggested new functions such as ‘checking donor’s past blood donation symptoms’ and ‘checking equipment information used for blood collection’ adding to ‘whether the blood donor is qualified to donate blood’ and ‘whether the donor’s ID is identical with blood-bags used during blood collection’. Furthermore, ‘task schedule table’ and ‘various statistics program’ are added to convenience of the person in charge.

Aims: Researchers examined the device that can meet ‘portability’ which enable staffs to carry and work with one hand, ‘functionality’ which enable staffs to process various important data in real time, and ‘high security’ for the importance of blood management works that process sensitive and important data including personal information.

Methods: In order to meet ‘portability’ and ‘functionality’ among the above three purposes, we have applied the smartphone to our work. We have selected specific models based on strict criteria and applied Mobile Device Management System (MDM), a security solution for mobile device management, to minimize part to manage, we also allow smartphone to utilize the LTE or 3G only, and limited the communication method by only the service through the VPN (Virtual Private Network) to secure the communication section.
P-011 AUTOMATION OF TRACEABILITY IN A BLOOD TRANSFUSION CENTER
H Abady, M Abbaa and A ElGohary
Egyptian National Blood Transfusion Center, Giza, Egypt

Background: The Egyptian National Blood Transfusion Services (ENBTS) has started a pilot implementation for the Blood Management Information Technology System (BMS), between its head quarters National Blood Transfusion Center (NBTC) and Tanta Regional Blood Transfusion Center in September 2016. The project will include another 15 sites. All of them will be connected through a secure Wide Area Network (WAN). One of the vital functions of the software is the facility to track different errors easily.

Aims: To illustrate how the applied software has facilitated the process of tracking several errors, through unit tracking and user tracking.

Methods: Traceability is done using different options:
1. Unit Tracking: It is one of the simplest ways used by the user to track a unit. All the user has to do is only enter the Donation Identification Number (DIN) and a detailed history for the unit will be displayed. For example:
   - The Unit Current Status: It displays the components separated from the entered DIN, is it available for issuing to hospitals and patients or not? Is it still pending any laboratory results? In case it is pending any results the user can access the results screen, to know which lab hasn’t entered the results yet. Is it pending the final ISBT label to be printed?
   - Unit Current Location: Is the unit still in the BTC, is it reserved to a specific patient, is it issued to a certain patient/hospital or is it available at a certain fridge/freezer?
2. Process Tracking: The users can track when certain process took place for a certain DIN. The results are displayed by user name, date and time of occurrence. Both of the above tools are used by users according to the permissions granted to them.
3. Database: At some stage we need the vendor company to interfere, in case we have problem in the traceability process. They interfere, by tracking the processes or the unit in the database, by running certain queries.

Results: There are two common problems that kept appearing especially at the beginning of the implementation, for example:
1. Unknown Unit: When the users at the issuing department try to issue a certain unit to a hospital/patient, they receive the message unknown unit. When they track the unit they find out that either the label was not verified or the unit was not released.
2. Donor In Process: The donor gave his donation, and at the next visit when the registrar tries to register a new donation, the donor status is still in process. Using the traceability function the user may find out that certain laboratory results were not entered by the users. Sometimes the DIN was entered wrong so the user couldn’t find the donation to which the result should be entered.

Summary/Conclusions: The implementation of the BMS is a positive step towards the automation of the ENBTS. The implementation of the BMS had a great advantage in terms of improved traceability quality and accountability. The traceability function in the software has been of great support to different user categories, especially the quality members, as it helped them to track down different errors raised.

P-012 Abstract has been withdrawn

P-013 CONSTRUCTION OF PUBLIC OPINION MONITORING AND CRISIS PREVENTION AND CONTROL SYSTEM IN BLOOD TRANSFUSION SERVICE
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Background: With the rapid development of we media, such as WeChat, microblog, network broadcast, the spread and influence of the public opinion have been greatly improved. Inevitably, the crisis caused by the negative public opinion shows great explosive and destructive force.

Aims: Dependent on the influence of public opinion, especially in the voluntary blood donation work, the Blood Transfusion Service should establish an efficient management of public opinion crisis.

Methods: By analyzing the characteristics of public opinion, tracking several network public opinion crisis management cases, using the methods of survey, literature and experience.

Results: Combined with practical work, this article summarizes a public opinion management system, whose main line is public opinion Collection - public opinion dealing – recovery. This system is based on a clear organizational structure, using modern network monitoring, and its principle focuses on prevention and early intervention. Meanwhile, six mechanisms have been established throughout the management system.

Summary/Conclusions: Through the implementation of this series of measures, the Blood Transfusion Service has improved its coping ability which lays a foundation for the steady development of voluntary blood donation work.

P-014 DISCUSSION ON HOW TO DO THE INFORMATION MANAGEMENT OF BLOOD STATION LABORATORY
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Blood Center of Gansu Province, Lanzhou, Gansu Province, China

Background: Blood station laboratory is the major department to provide the information of blood collection and supply. Therefore, its information management is of particular importance.

Aims: To improve the information management of laboratory of blood station, ensuring the security of information detection, software system, internal network and data transfer is significant parts of the daily work of blood station laboratory.

Methods: According to the source of the blood station laboratory, the writer divided information into three categories: first, the resulting information blood donors; second, operating parameter information on laboratory equipment and laboratory information management system; third, the native software of equipment and computer.

Results: According to the classification, information management of blood station laboratory presents different characteristics. It has management difficulties and weak spot, such as the imperfection on relevant laws, regulations and the systems; as for the requirements in terms of access, the suppliers of computer information management system are not adequate; the ability of emergency processing and recovering to the normal operation for accident of computer management system needs to be strengthened.

Summary/Conclusions: Based on the problems above, the author puts forward some suggestions to improve the information management system of blood station laboratory. First, to improve the information management regulations, level-to-level administration and responsibility assignment should be conducted. Date backup needs to be well-established. Second, we should formulate information management standards, put forward specific requirements and other measures to strictly control the access of administrations to the information management system. Much emphasis should be put on the protection of information management of blood station laboratory to ensure the information security of blood collection and supply, to protect the staff and to provide better services for the patients.

Training and Education

P-015 Abstract has been withdrawn

P-016 TRAINING AND EDUCATION SITUATION OF TRANSFUSION PRACTITIONERS IN GUANGZHOU
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Background: Blood transfusion medicine is becoming more and more close to clinical medicine. Much work of transfusion practice pays more attention to "Blood" decades ago shift to "Patient" in recent years. Transfusion practitioners not only focus on blood but also responsible for clinical consultation, blood management and even treatment. There are various training courses organized by hospitals and blood centers all year around. However, the training pattern is conservative and backward.

Aims: The characteristics and shortages of current situation are discussed and explore new training strategies for transfusion practitioners.

Methods: This study is based on the empirical research method and questionnaires were allocated after annual training in the form of lecture. Totally 457 valid questionnaires were collected.
Results: Most transfusion practitioners started to work in blood centers and transfusion department in hospital after graduation, lacking of clinical practice. Training and education is mainly “one-to-many” in instead of “one-to-one” teaching. However, from the questionnaires, majority (99%) transfusion practitioners show satisfaction with the training course and no suggestions on contents and methods of training. The other suggestions include innovation of the content and training pattern, improve the dietary during training and shorten the training time.

Summary/Conclusions: The result shows a positive acceptance of training knowledge in transfusion practitioners. Meanwhile they have no ideas with learning reinforcement between transfusion and clinical practice. The concept of transfusion is hysteretic that there is a general deficiency of clinical knowledge in transfusion practitioners. The core of teaching method is to ask learners to be automatic learning instead of passive learning.

P-017

DISCUSSION ON THE-JOB TRAINING MODE OF EMPLOYEES IN BLOOD BANKS
L Tao
Quality Control Section, Changsha Blood Center, Changsha, China

Background: Staff training and assessing must be proceeded according to the measures for the blood banks management, Blood bank staff can go to work officially after specially training and assessing and reaching the requirements of post qualification.

Aims: To understand the on-the-job post training situation and possible factors, and to establish relevant training system.

Methods: To collect and analyze the situation of on-the-job training persons who have ever attended the training in Changsha Blood Center from 2005 to 2016.

Results: After establishing a perfect on-the-job training system, the examination result is obviously better than before.

Summary/Conclusions: To establish on-the-job training system is the foundation to proceed smoothly with working on blood banks, and it is an important method to improve not only for quality system establishment of the blood banks, but also the quality of the collected blood.

P-018

THE IMPORTANCE OF DIVERSIFIED TRAINING IN THE DEVELOPMENT OF BLOOD STATIONS
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Suihua City Center Blood Station China, Suihua, China

Background: As the knowledge structure of blood bank staff is uneven, they always focus on the training of professional knowledge, and pay great attention to the lack of professional ethics, corporate culture, public relations etiquette and so on.

Aims: In order to strengthen the management of blood bank, to provide better service for blood donors and patients, to promote further development of blood station, to improve the comprehensive quality of blood station staff, and to adopt diversified training method.

Methods: By increasing the training frequency and time, from 75 h to 100 h, on the basis of general training, diversified training, innovative training forms. For example: send personnel to visit the higher level units, hire professional training team, guide public relations etiquette, improve professional ethics, once a month between middle-level leadership of classical culture, historical stories, essays on modern inspirational Reading Festival full of poetry and prose, speech contest, held on the blood of special enterprise culture forum and so on. Assessment evaluation method innovation of training effect, make full use of information technology, the opening of the paperless training assessment system, implementing flexible evaluation.

Results: Through the diversification of training, business knowledge has been innovation of training effect, make full use of information technology, the opening of the paperless training assessment system, implementing flexible evaluation.

P-019

DEVELOPING THE BLOOD TRANSFUSION – TRAINING AND EDUCATION ARE TOP PRIORITY
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Background: Now the cultivation of talents is closely related to the development of blood stations, in quality and professional work management, talent is also the most important factor, therefore, it is urgent to establish and perfect the training and education mechanism.

Aims: Put forward reasonable establishment and improvement of talent training and education mechanism in blood station, suggestions and strategies for the development of blood stations.

Methods:
1. Establish the goal of training/A training target.
2. Stratified and staged targets are established:
3. Perfecting evaluation system.
4. To develop the training incentive mechanism.

P-020

STUDY OF STANDARD OPERATING PROCEDURES USING VIDEO
H Hui
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Background: Standard operating procedures (SOP) are an important part of the quality management system. The SOP training effect of employees is closely related to their performance.

Aims: To study the feasibility of standard operating procedures change to video type.

Methods: Writing standard operating procedures with theory and actual. Using material rewards: Material incentives for completing training are also essential, give spiritual forms “red flags” for example, or other forms. By using these methods and measures, gradually change from the previous passive state “make me learn” to active state “I want to learn”, to ensure the full implementation of the established training target.

Material rewards: Material incentives for completing training are also essential, give active personal and department higher learning materials or other meaningful rewards.

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Var Sanguinis (2017) 112 (Suppl. 2), 5–191
Results: Finished some standard operating procedures video, and applied to staff operation.

Summary/Conclusions: Standard operating procedures video can verify the SOP operability, standardized staff operation; video data easy to save, just in time to use, and solve the problem at any time. Standard operating procedures video is easy to training new employees.

P-021
THE IMPORTANCE OF ETIQUETTE TRAINING IN BLOOD DONATION SERVICE
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Background: Blood stations should provide open service to the society for the blood donors. The good behavior of the staff represents the Image of blood stations directly and deeply. Standard degree of statements and actions, professional degree of medical techniques and satisfaction of service level are convincing evaluation indexes to the blood stations.

Aims: The staff should master skilled technical expertise and be highly educated and cultivated. To improve the whole character of the staff, we strengthen their professional skills and ethics, reinforce the etiquette training and take steps to guarantee the training results in the continuing education.

Methods: Making training plan, taking versatile forms in the training course, attracting the staff's participation, building the atmosphere of learning, improving the training results. After centralized training, let the staff apply them to practice. In order to guarantee the training results, evaluation mechanism, supervision and administration are needed.

Results: The blood donors' satisfaction is improved year by year with the carrying out training continually.

Summary/Conclusions: Professional etiquette is an important way for medical staff to publicize their professional image and win social recognition. In the face of unpaid blood donors, blood station staff should be grateful and give them respect and admiration and give them the best service. For blood stations, it is an effective way to maintain good impression in the blood donors to make the etiquette throughout all the services. It can lay a solid foundation to develop fixed unpaid blood donors, win the trust and respect of them and reduce the risk of blood usage.

P-022
PRELIMINARY ESTABLISHMENT OF THE INTERNAL QUALITY ASSURANCE SYSTEM OF TRANSFUSION MEDICAL NETWORK COURSE IN BEIJING UNION MEDICAL COLLEGE
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Background: Although blood transfusion medicine education is increasing emergence, the level of teaching materials lags far behind the development of blood transfusion medicine. The refresh speed of the current domestic teaching materials is so slow, and meanwhile, most of the teachers haven’t received the systematic training of transfusion medicine, these cases lead to the situation that the teaching theories fail behind the real practice.

Aims: Preliminary inquiry into the method of the internal quality assurance system of transfusion medical network course, establish the Yale remote course dedicated web site, to further improve the Union Medical College in blood transfusion medicine higher education resources.

Methods: According to the concept of ICDE review, establish a complete internal quality assurance system of transfusion medical network course, which based on “development – implementation – checking – feedback – rectification”. The purpose of this paper is to explore five aspects, such as objectives, curriculum design and learning resources, teaching staff, teaching process and assessment.

Results: Established the internal quality assurance system of transfusion medical network course, and further improved in the teaching process. assurance system is conductive to guarantee and improve the quality of transfusion medical higher education.

P-023
IMPLEMENTATION OF INFECTION CONTROL STANDARDS IN EGYPTIAN NATIONAL BLOOD TRANSFUSION SERVICE
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Background: Health care associated infections are a worldwide problem. They occur across all points of health care delivery. Thus, the fundamentals of infection control need to be employed regardless of constraints in resources and support. These fundamentals are essential to protect the donor, patient, clients and provider against exposure to infectious microorganisms and against the morbidity and mortality associated with these agents.

Aims: Implementation of infection control standards in Egyptian blood transfusion services.

Methods: The infection control team developed an action plan for implementation of the infection control program in the Egyptian national blood transfusion services. It included maintaining an appropriate infrastructure, ensuring the availability of supplies, establishing effective infection control practices, improving the occupational health management system, development of surveillance for nosocomial infection and training of health care providers. The plan is reviewed and updated annually. In 2013 the infection control team initially formulated infection control standard operating procedures and distributed them to one central and 24 regional blood transfusion centers. They referred to Egyptian national infection prevention and control guidelines and policies for health care services as well as American association of blood banks standards. The standard included infection control practices concerning hand hygiene, waste management, personal protective equipments, safe injection (prevention of needlestick and sharp injuries), environmental cleaning, post-exposure prophylaxis, aseptic techniques, reprocessing of instruments, surveillance of nosocomial infection, facing emerging and re-emerging illness, laboratory working instructions and dentistry working instructions. The infection control team provided initial training and guidance to a total of 181 individuals including infection control officers, heads of different departments and health care providers of national and regional blood centers. Periodic assessment, supervision, monitoring and training of health care providers as well as annual evaluation of infection control program were performed.

Results: Improvement of the infrastructure as regards construction of hand washing basins and establishment of central sterile services area for reprocessing of instruments to ensure high standards of decontamination. Introduction of new supplies of infection control as disposable aprons and disposable tourniquets. Vaccination coverage of health care providers for hepatitis B is more than 95%. Training of the majority of health care providers. Statistical evaluation of the implementation of the infection control program in the Egyptian national blood transfusion centers. They referred to Egyptian national infection prevention and control guidelines and policies for health care services as well as American association of blood banks standards. The standard included infection control practices concerning hand hygiene, waste management, personal protective equipments, safe injection (prevention of needlestick and sharp injuries), environmental cleaning, post-exposure prophylaxis, aseptic techniques, reprocessing of instruments, surveillance of nosocomial infection, facing emerging and re-emerging illness, laboratory working instructions and dentistry working instructions. The infection control team provided initial training and guidance to a total of 181 individuals including infection control officers, heads of different departments and health care providers of national and regional blood centers. Periodic assessment, supervision, monitoring and training of health care providers as well as annual evaluation of infection control program were performed.

Summary/Conclusions: Infection control is a necessary component of safe, high quality blood supply. The infection control program is not only committed to prevent adverse outcomes such as health care associated infections but also contributes to qualitative improvement of blood transfusion services.

P-024
ANALYSIS OF THE CAUSES OF DEFERRAL OF BLOOD DONATION IN NINGXIA AND TAKE EFFECTIVE MEASURES FROM 2010 TO 2016
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Background: There are 5 blood stations in Ningxia district, one of which is the blood center of the province (grade), and 4 [1] of the blood station of the city (grade) center. Since the 2010 implementation of blood concentration detection in
Ningxia, Ningxia blood center, give full play to the advantages of centralized testing center laboratory by analyzing blood during the operation of unqualified reason, take preventive measures in time, greatly improving the detection accuracy, effectively avoid the blood resource waste, ensure the safety of blood.

Aims: Analyze the causes of disqualification of blood donation in Ningxia and take effective measures to reduce the scrap rate.

Methods: Statistical analysis of the reasons for the disqualification of blood donation in Ningxia from 2012 to 2016 uses of disqualification of blood donation in Ningxia and take effective measures to reduce the scrap rate.

Results: From 2012 to 2016 in Ningxia to develop the whole blood concentration detection, blood scrap rate reduced year by year, from 3.4% in 2010 to 1.72% by 2016, including inspection items scrap ratio decreased from 2.95% in 2010 to 1.51% in 2016. The scrapping rate of non-test items also declined from 0.45% in 2010 to 0.21% in 2016.

Summary/Conclusions: Strengthen the district personnel operation training, the professional attitude and the future policy which should be developed according to the current situation.

P-025
THE POTENTIAL IMPACT OF NAT INTRODUCTION – AS MAJOR PILLAR IN TRANSFUSION STRATEGY IN ROMANIA – REGARDING BLOOD DONATION, BASED ON THE ASSESSMENT OF 2014–2016 ACTIVITY
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Background: The study design was already applied to regional level (Bihoar County, Romania) and presented at ISBT Copenhagen 2017; being taken into account the previous study conclusions, the present one is a logical and more complex continuation at national level, about the impact of NAT introduction for donated blood, and measures which should be taken for increasing the transfusion safety and the number of blood donors, both major objectives for national strategy.

Aims: To analyze the causes of disqualification of blood donation in Ningxia and take preventive measures in time, greatly improving the detection accuracy, effectively avoid the blood resource waste, ensure the safety of blood.

Methods: Statistical analysis of the reasons for the disqualification of blood donation in Ningxia from 2012 to 2016 uses of disqualification of blood donation in Ningxia and take effective measures to reduce the scrap rate.

Results: From 2012 to 2016 in Ningxia to develop the whole blood concentration detection, blood scrap rate reduced year by year, from 3.4% in 2010 to 1.72% by 2016, including inspection items scrap ratio decreased from 2.95% in 2010 to 1.51% in 2016. The scrapping rate of non-test items also declined from 0.45% in 2010 to 0.21% in 2016.

Summary/Conclusions: Strengthen the district personnel operation training, the professional attitude and the future policy which should be developed according to the current situation.

P-026
STUDY ON THE RISK FACTORS OF GETTING INFECTION AMONG BLOOD COLLECTING NURSES FOR BEING STABBED
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Background: According to the World Health Organization (WHO), the rates of HIV, hepatitis B virus (HBV) and hepatitis C virus (HCV) infections upon needlestick injuries are 0.3%, 3.0% to 6.0% and 1.8%, respectively. Needlestick injuries often have a serious negative psychological impact on the infected people, and it is easy for these people to be pessimistic. Those, who are infected by HBV or HIV, will often develop long-lasting psychological disorders. Some will shout and scream while some will talk less or even become suicidal. If medical staff who work on the caring line, are mentally not stable, it is not only difficult for them to focus on blood collection, but their condition might also influence their working skills. Meanwhile, it will produce a certain degree of negative emotion on other staff working at the blood bank, which may lead to errors in blood collection, even leading to panic.

Aims: To analyze the risk of infections following needlestick injuries among blood collecting nurses.

Methods: We observed and analysed the complications occurred during blood draw.

Results: After needlestick injury, nurses could be infected by a small amount of blood containing infected virus. Moreover, the HBV prevalence was from 0.2% to 0.4%, as a result, the chances of HBV infection is 19 to 40%, and the infection ratio by HIV virus is from 0.2% to 0.6%.

The main causes of these needlestick injuries are the long working hours, the crowded working environment and the inappropriate operation.

Summary/Conclusions: In order to prevent future needlestick injuries and virus infection, it is necessary for nurses to improve their working environment, urge them to strengthen professional study and personal qualities, and develop their individual theoretical level, operational proficiency and working responsibilities.

P-027
IMPLEMENTATION OF HIGHEST LEVEL CONDITIONS AND STANDARD AGAINST INFECTIOUS AGENTS
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Background: Highest level of safety is required for work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections, agents which cause severe to fatal disease in humans for which vaccines or other treatments are not available.

Aims: Achieving a good level of safety when working with dangerous and exotic agents.

Methods: When dealing with biological hazards at this level the use of self-contained oxygen supply is mandatory. The entrance and exit of this level biolab will contain multiple showers, a vacuum room, an ultraviolet light room, and other safety precautions designed to destroy all traces of the biohazard. Multiple airlocks are employed and are specifically secured to prevent both doors opening at the same time. All air and water service going to and coming from a highest level of safety lab will undergo similar decontamination procedures to eliminate the possibility of an accidental release. All the following conditions which is mentioned in the results section must be implemented.

Results: The laboratory supervisor must enforce the institutional policies that control access to the laboratory. Eating and drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption must not be permitted in laboratory areas. Mechanical pipetting devices must be used. Policies for the safe handling...
Blood Supply Management and Utilization

P-028
TO EXPLORE THE YANGZHOU AREA SHIELDED UNPAID BLOOD DONORS APPLY FOR REJOINING STRATEGIES AND FOLLOW-UP SURVEY
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Background: In recent years, with the mining, the cause of the further development of blood supply, blood quality and blood transfusion safety has been more and more attention and attention, blood collection institutions to increase the investment in testing equipment, reagent sensitivity has also been greatly improved. Highly sensitive reagents can lead to false reactivity. The result of the counterfeit reactivity of the reagent will be treated permanently and will cause psychological and mental stress to these shielded donors.

In order to protect the rights and interests of donors, the US FDA published in July 2005 the "HIV-1 and HCV nucleic acid detection, blood treatment and blood donors shielding and return to the guidelines", China in September 2013 by the China Blood Transfusion Association blood quality management The Working Committee has issued a Guide to Screening and Rejoining Respondents. However, since the above guidelines are not mandatory, the implementation criteria are not uniform and there are difficulties in implementation, and some of the blood collection agencies are still out of blood safety considerations. With a cautious attitude, leading to the current self-blood donors in the field of rehabilitation is difficult to reunify.

Aims: To explore the Yangzhou area of unpaid blood donors to shield the rejoining strategy for the results of the blood donors responsible for the test.

Methods: Primary screening colloidal gold method to detect HBsAg, TP results of reactive blood donors, the blood ELISA test results to determine the treatment. Previ-

ously, due to ELISA [HBsAg, anti-HCV, anti-HIV] single reagent reactive screening of blood donors, specimens sent to Jiangsu Province, the blood center to further confirm.

Results: 33.47% of the colloidal gold detection of reactive blood donors were tested by ELISA double reagent was negative; once tested by ELISA single reagent to respond to blood donors eligible for returnees in 182 cases, accounting for 37.22%.

Summary/Conclusions: It is necessary to take a shield and rejoin the blood donors who have been tested for colloidal gold and who have been tested by ELISA. They can restore some of the blood donors, protect the blood donation rights of the blood donors, reduce the damage and disputes to the blood donors, is conducive to blood and blood donors who communicate.

Salah satu penelitian yang menunjukkan bahwa...
Forty-four individuals (5.2%) who were given 5 or more D- RBC units consumed 583 units (37.4%) in total. The main indications for transfusion were end-stage renal failure, haematological and non-haematological malignancies and Cooley’s anaemia. These included 2 D- patients with haematological disorders who developed anti-LW in the course of the disease and were given D- RBC empirically as LW antigens expressed weaker in the absence of D antigen. A total of 125 (8.0%) D- RBC units were transfused to non-Chinese patients (including 8 neonates) and 22 neonates of ethnic Chinese.

Summary/Conclusions: These data reflected the current status of inventory management and utilisation practices of transfusion of D- RBC in Hong Kong. To cater for emergency situations, obstetric and neonatal indications, it is not uncommon to over-stock D- RBC into the inventory of hospital blood banks with the outcomes being either the units transfused into D+ patients near the end of the product shelf-lives or expired. Re-evaluation of hospital blood bank inventory holding policy may lower the demand of RBC products of this infrequent phenotype.

P-031
BLOOD INVENTORY MANAGEMENT AT A BLOOD TRANSFUSION SERVICE OF A SPECIALIZED LIVER CENTRE

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Background: Blood inventory management is core of any Blood Transfusion Services (BTS). The key to a successful BTS is the timely provision of required blood components while avoiding wastage of the same. It is even more challenging for hospital based BTS, which has to balance both the collection and issue of blood components.

Aims: To develop an algorithm to determine the ideal inventory levels for the BTS of a specialized liver centre.

Methods: The study was retrospective, analytical and non-interventional. Data on various parameters of inventory management such as blood collection, requests, cross-match, issue and wastage were collected and analyzed. Thirty six cross-sections of data (2 per month) were randomly analyzed to find the median age of blood units, group wise availability and issue details. Data on zero stock/low stock and fluctuations in demand and supply were collected and analyzed. We derived two formulas to determine ideal inventory levels and the required blood collection.

The inventory levels for shortage/ideal/excess inventory were determined and colour coded to improve monitoring of inventory and take appropriate action to maintain it.

Results: During the study period, a mean of 684 donations per month were collected, of which 10.8% were discarded due to TTI positivity. The collection exceeded the issue for packed red blood cells (PRBC), random donor platelet concentrate (RDPC) and single donor platelet concentrate (SDPC) while the issue of cryoprecipitated (CP) and fresh frozen plasma (FFP) exceeded the collection (this skew was due to the fact that our BTS caters predominantly to liver disease patients). A total of 9.67 PRBCs, 6.27 FFPs, 16.01 RDPCs, 2 SDPCs, and 6.4 CPs were discarded per month.

The ideal stock of PRBCs was 16.68, 7, 56.7, 8.5, 12.2, 3, 39.1 and 10 units for A positive, A negative, B positive, B negative, AB positive, AB negative and 0 negative blood group units, respectively and the issuable stock index was 4.105, 3.8, 11.8, 14.1, 10, 5, and 5 days for the same. There were on an average 1.015 donations/issue/month. The overall PRBC stock per issue was 5.44 or 5.441 units and the overall issuable stock index was 3.84 days. The cross-match held units were 1.61% (CP:HT; cross-match:holding time) and cross-match/transfusion was 1.94.

Effective holding time was, therefore, 0.82 days (1.61/94).

The ideal stock levels were calculated to be 5-7 IS (issuable stock) and was colour coded green. IS at 2-4 and 0-1 were coloured coded as yellow and red, respectively and higher values of 7 and above were coded blue to reduce wastage. The Ideal stock of PRBC, FFP, CP, RDPC and SDPC was calculated to be 600, 823, 295, 289 and, 33 units per month, respectively. The required blood collection was approximately 24/day. This would still leave us with a shortfall of 225 units of FFP which would have to be procured from outside.

Summary/Conclusions: This study was an example of a practical approach to develop an optimal inventory level in a standalone hospital based BTS. It also highlights the issues faced in inventory management in specialized institutes with skewed requirements.
Results showed that there is no significant relationship between the high shortfall of phenotyped RBC with improper issuance of requested blood (P > 0.05). The Gage R&R Study revealed that phenotyped RBC arrangements into a specific blood tray varied among the inventory officers, resulting rarer blood type not being replenished to the specific blood tray, hence contributing to the shortfall of phenotyped RBC inventory. Historical data showed that phenotyping of RBC had increased by 8 folds over the past 5 years. However, the increase did not significantly improve the phenotyped RBC inventory level. Phenotyping workflow analysis showed that most of the newly tested phenotyped RBCs were not placed into the phenotyped blood inventory but distributed as normal blood. This was because these blood were not being relabeled with phenotype printed on the label.

Summary/Conclusion: Varied RBC arrangement method contributes to the shortfall of the phenotyped inventory. A guideline based on the prevalence of RBC phenotype of our population demographics would be provided to guide inventory officer when arranging phenotyped RBC. A new workflow was proposed to hold the RBC units selected for phenotyping and to be relabeled when the blood unit is found to be suitable for topping up the phenotyped RBC inventory.

P-035
PREPARATION OF A MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE FOR THE DISTRICT GENERAL HOSPITAL HAMBANTOTA SRI LANKA
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Background: A study on red cell requests and usage pattern in District General Hospital (DGH)-Hambantota in 2016 was found to have cross match to transfusion (C:T) ratio of 3.24:1 and 9.27:1 among General Surgical and Gynecological Obstetrics units respectively. High C:T ratios were noted in other surgical specialties and therefore it highlighted the necessity of the Maximum Surgical Blood Ordering Schedule (MSBOS) for the hospital.

Aims: To find out the C: T ratio, Transfusion Index (TI) Transfusion Probability (%T) for the surgeries/procedures that are performed at DGH-Hambantota and to group surgeries/procedures which have a C: T ratio ≥ 2.5:1 and/or TI of ≥ 0.5 and/or %T ≥ 30% into Group, antibody screen and Save (GSS) category.

To group others into the category that needs blood to be cross matched and to prepare the MSBOS for DGH Hambantota.

Methods: Retrospective study was done using the cross match request forms for Red Cell Concentrate (RCC) and RCC issue Register and analysed. The study period was 01st of January to 31st of December, 2016. 7972 request forms were evaluated to find out total surgeries/procedures during the study period. Even though total of 189 surgeries/procedures were categorized during the study period, 60 surgeries/procedures were performed only once in the year 2016 and they were excluded from the study.

Results: All Surgeries has C:T ratio ≥ 2.5:1 except for the Above/Below Knee Amputations (C:T ≥ 2.3:1, %T = 100%) and Open Prostatectomy (C:T ≥ 2.5:1, T=1.3, %T = 100%). In Laparoscopic surgeries (C:T ≥ 2.91:1, %T = 0.02% T = 1.52) Thyroid surgeries (C:T ≥ 77:1, %T=0.02% T= 1.13%) and Caesarean Section (C:T ≥ 74:1, %T=0.01, %T = 1.34%) all 3 parameters are as mentioned.

The Medical Induction in miscarriages and blood reservation for major/minor degree Placenta Previa patients also had a very high C:T ratio of C:T ≥ 77:1 and C:T ≥ 82:1 respectively with low TI and % of TI=0.01, %T=0.18% and, TI=0.04 %T=0.64 respectively. Lap and Dye Test, Laparoscopic Cholecystectomy, Hemithyroidectomy/Thyroid Lobectomy, Mastectomy=Axillary Clearance, Laparoscopic Appendicectomy did not use any transfusion even though 143, 119, 86, 34 and 28 RCC units were cross matched respectively.

Summary/Conclusions: When considering all three parameters, Laparoscopy Surgeries with suspected ectopic pregnancy, Oesophagectomy, Wide Local Excision of Buccal Mucosa, Anterior Resection, Wound Toilet and Haemorrhoidectomy are grouped into surgeries that need one blood unit to be cross matched. Above/Below Knee Amputations and Open Prostatectomy need 2 blood units to be cross matched. Laparotomy, almost all Laparoscopic surgeries excluding suspected ectopic pregnancy, Caesarean section, Thyroid, Breast, Urological and Colorectal surgeries excluding Anterior Resection and Haemorrhoidectomy, Splenectomy, Internal Fixation of Fractures, Hemiarthroplasty, abdominal and vaginal hysterectomy, Medical Induction in miscarriages, Placenta Previa can be grouped into GSS category which does not need blood units to be cross matched if the antibody screening is negative. Even though the study shows that the Placenta Previa and Laparotomy comes under G S category after a negative antibody screening, request of 3 blood units is the practice in DGH Hambantota.

P-036
A SURVEY OF BLOOD SUPPLY IN CHINA DURING 2012–2014
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Background: China is a middle-income country, which hosts more than 20% of world population. Increasing of the blood supply in China, along with increased health care coverage raises many challenges.

Aims: The aim of this study was to understand the status of blood products supply in China during 2012–2014.

Methods: The survey questionnaire about blood center activities were sent to all blood centers of 32 provinces via internet. The data were collected from responses and analyzed using Microsoft Excel 2013.

Results: The total supply of whole blood and RBCs in 2012 was 18,644,700 units, in 2013 18,985,800 units, and in 2014 19,658,800 units. A similar trend of the total platelets (PLTs) supply was also observed during the same period of time of 2012 to 2014: 1,019,100 units in 2012, 1,168,400 units in 2013 and 1,276,200 units in 2014. Similarly, the plasma supply was 27,529,300 units in 2012 and 27,657,600 units in 2013, which rose to 28,307,500 units in 2014. The total cryoprecipitate supply were 1,653,900, 1,891,300 and 2,166,500 units in 2012, 2013 and 2014, respectively. When the blood supply was analyzed according to geographic regional population, large differences of rates of blood supply between regions were evident.

Summary/Conclusions: The blood products supply in China was steady increasing, Blood centers in China continue to face the challenges of providing sufficient blood supply in the future.
Background: Zhengzhou is the capital of the most populous provinces in China. Recent years, the amount of blood supply is at record highs every year, but the actual demand of medical institutions is quite large, which leads to the phenomenon of insufficient blood supply and partial blood type lasts a long time in a year. This situation has affected patients with rapid blood service. To explore a breakthrough has become an urgent problem to be solved.

Aims: Through the analysis of the blood collection and blood usage of medical institutions, and the development of the local population and medical institutions, to further assess the future trend of the local blood supply, to study effective long-term donation development measures, and to improve the blood supply situation.

Methods: Statistical analysis the volume of blood collection and supply in Zhengzhou area, and the development of population size in this region and the development index of medical institutions, from 2012 to 2016.

Results: From 2012 to 2016, the population of Zhengzhou increased from 9.3 million to 9.7 million, the average annual growth rate of 1.9%. The number of medical institutions increased from 2807 to 3661, the increase in the number of 156, the increase was 4.1%. The number of beds in medical institutions increased from 57894 to 85914, the average annual growth rate of 10.4%. The number of blood donors increased from 190 thousand to 210 thousand, the average annual growth rate of 2.1%. Thousands of blood donation rate remained at between 18.8 to 21.6. Blood donors donate blood volume increased from 64352600 ml to 66198700 ml per year, the average annual growth rate of 0.7%. During 2015, the group booking blood donors donate blood volume accounted for 85.4%. During 2016, the group booking blood donors donate blood volume accounted for 30.7% to total blood volume, individual voluntary blood donors accounted for 69.3%. Medical institutions use blood volume increased from 310 thousand units to 400 thousand units. The amount of cryoprecipitate, irradiation of red blood cell, apheresis platelet and other blood components used increased significantly, followed by an increase of 246% - 145% -120%. In contrast, the amount of whole blood and concentrated handmade platelets used decreased significantly, followed by an increase of ~68.1% - ~99.3%.

Summary/Conclusions: In recent years, the number of people who donate blood, blood donation rate, blood donation volume, the utilization rate of blood components and so on all have been greatly improved. In the past, most of the volume of blood is collected from individuals in the streets. Nowadays, group reservation donors play a more and more important role in voluntary blood donation. The amount of Washed red blood cells - irradiated red blood cells - apheresis platelet and cryoprecipitate use increased. The amount of whole blood that easily stimulates transfusion reactions use has fallen sharply. However, the blood supply growth rate is lower than the blood demand growth, lead to the blood supply and demand is still serious, This means that the next few years will be more serious. Development of long term mechanism of voluntary blood donation needs Support and help from all walks of life, needs to effectively integrate the province’s blood resources, to solve the provincial capital supply pressure.

P-040
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Background: Although blood components are scarce resources, their wastage has been continuing to be a problem at hospitals all over the world. As there is not comprehensive study about hospital wastage in Iran, the first aim of the study was to identify the WAPI “wastage as percentage of issues” of RBC, FFP and PC during 2005 to 2015 and the second goal focused on reasons of the blood product wastage.

Aims: The first aim of the study was to identify the WAPI "wastage as percentage of issues" of RBC, FFP and PC during 2005 to 2015 and the second goal focused on reasons of the blood product wastage.

Methods: In this project, during mentioned period, wastage as a percentage of issues (WAPI) was calculated for RBC, PLT, and FFP separately. In addition, for each product, the percentage of wastage was calculated as divided to total of the unit wasted.

Results: From 2005 through 2015, wastage rate of RBC, FFP, and PC were 5.7 ± 0.7, 1.4 ± 0.4 and 3.2 ± 0.5 respectively. The main cause of wastage of RBC, FFP and PC was expiry of date and among in date wastage, the major reason was unused units. Although the outdated units of RBC and FFP decreased, there was an increase in outdated units of PC. In contrast to the outdated units, the percentage of unused RBC and FFP increased, whereas unused PC decreased.

Summary/Conclusions: This study indicated the WAPI of RBC, FFP, and PC focused on reasons of the blood product wastage. By understanding the reasons of discarded units, hospital transfusion committee can develop plans to improve performance and minimize the number of discarded blood to a reasonable rate.

P-041
ANALYSIS OF CHANGSHA BLOOD CENTER BLOOD SUPPLY FROM 2010 TO 2016
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Background: With continuous development of Blood donation work, there has been significant progress in clinical blood component transfusion, but poor clinical blood supply was happen occasionally.

Aims: To investigate the situation of quantity and variety of the blood supply in Changsha blood center from 2010 to 2016.

Methods: By using retrospective study method, we collected the data about Changsha blood center supplying blood to medical institutions in the whole Changsha area from 2010 to 2016. We studied the variation trend of clinical blood application.

Results: The total blood supply of Changsha blood center from 2010 to 2016 mainly changed in red blood cell and platelet supply. The average annual growth rate of blood supply is 5.1%. It is declined slightly from 2010 to 2012, and then it steadily grew after 2012. It is hard to transfuse whole blood, but the proportion of Clinical blood component utilization reaches to 99.78%, more to 99.99% since 2014. Red blood cell and plasma are supplied steadily, increased a little, and the annual average growth rate
1.1% and 2.68%, respectively. However, the supply of blood platelet and cryoprecipitation grow rapidly and the annual average growth rate is 22.66% and 50.44%, respectively.

**Summary/Conclusions:** This paper shows that clinical blood component supply has further developed to be scientific and reasonable, but the supply levels of red blood cell and plasma were growing up slowly. It also provides scientific basis to draw up rational plans for safety, time, effective blood-supply and formulate thorough strategies of recruiting blood donors.

**P-042**

**ANALYSIS IN EMERGENCY SUPPORT FOR BLOOD SERVICE ABOUT JUL 21 GUDUN ROAD EXPLOSION**

J Liu, J Xu, Z Jin, Y Yan, Y Wu and W Hu

Blood Center of Zhejiang Province, Hangzhou, Zhejiang Province, China

**Background:** In recent years, public emergencies have occurred frequently in the world, the blood service is an important part of medical rescue. There has been a hot issue how to react quickly in unexpected public events to protect the clinical blood effectively in the study of emergency management of domestic blood service institutions.

**Aims:** Analyzing the characteristics of emergency support of blood service to supply strategy of blood supply in Jul 21 Gudun Road explosion.

**Methods:** Through blood service and routine drill of the G20 Summit and 7.5 bus arson, the emergency plans for blood services are gradually improved in Zhejiang Province Blood Center. Jul 21 Gudun road explosion has happened, we start emergency blood supply plan immediately, opening green channel, supplying the blood for hospital that receive the wounded, guaranteeing needs of clinical rescue blood. Starting emergency blood sampling plan, adding blood collection staff and site service personnel, adjusting the layout of blood donation sites Rationally, extending the opening hours of blood donors, reinforcing news propaganda, Increasing material delivery and serving people enthusiastically to donate blood.

**Results:** July 21 to 24, a total of more than 3500 people collected blood donation total of more than 5200 U. July 21 10:00 to July 25 at 8:00, a total of more than 41,000 ml of red blood cell suspension to the hospital, frozen plasma more than 175,000 ml. 335 units of platelets alone, cold precipitate coagulation factor 10 units, effectively protect the treatment of the Explosive of the wounded.

**Summary/Conclusions:** Emergency plan of blood service of built on the basis of exercise, that can play an active role in blood In public health emergencies, after the practice of emergencies.

**P-043**

**THE ANALYSIS AND PREDICTION OF RED BLOOD CELL USE IN FUZHOU**

X Chu, J Liu, L Huang and M Wang

Fujian Blood Center, Fuzhou, China

**Background:** Concerns have been raised that the reform of the medical and health system will increase the demand for red blood cell (RBC) products. Modeling can be applied to predict RBC demand and aid future planning for donor recruitment and transfusion services.

**Aims:** To analyze RBC products used in hospital, Fuzhou, and use mathematical model to predict the demand of RBC products.

**Methods:** RBC supply in Fuzhou from 2007 to 2016 was retrospectively analyzed, and autoregressive integrated moving average (ARIMA) model was used to model RBC transfusion in 2007–2016 and predict the RBC demand in 2017.

**Results:** 1) Blood component transfusion rate has been 100% since 2010 (except for one case used 6 unit whole blood in 2014); 2) The average growth rate of RBC transfusion from 2007 to 2016 was 1.8%, A • B • O • AB type RBC accounted for 28.1%(27.5–28.4%), 24.6%(24.4–25.0%) • 40.7%(40.4–41.3%) • 6.6%(6.2–6.9%) respectively; 3) The average monthly RBC usage was 10488.7 unit from 2007 to 2016. RBC transfusion in January • February • July and August was lower than average; 4) The average RBC usage of every hospital bed was decreased from 7.64 U/bed in 2008 to 4.39 U/bed in 2016, decreased by 42.6%; 5) Use the ARIMA model to predict the RBC demand in 2017, except for AB type, the A • B and O type RBC predict demand value from January to June was matched the actual usage value perfectly, the average relative error was <10%; The ARIMA model predicts an increase of RBC demand by 8.9% in the second half of 2017 compare with the same period in 2016.

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P-047
RESEARCH ANALYSIS OF THE DEPARTMENT OF BLOOD SUPPLY IN HEBEI PROVINCE BLOOD BANKS SYSTEM AND A COMPARISON WITH HEBEI PROVINCE BLOOD CENTER
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Background: The author investigates the basic situations such as the amount of blood supplied per year, inventory level per day, the maximum space for blood storage, responsibility of departments, distribution of staffs in positions, size of the place and networking with hospitals in the 12 blood banks in Hebei province. There is a difference in the amount of blood supplied per year, space for blood storage, working space size, distribution of staffs or responsibility of departments between blood centers. There is a considerable difference in the workload per person between blood centers. Missing of information scanning during delivery is hidden in the blood centers lack of persons, equipments or work place. The report is as follows.

Aims: To understand the status of the department of blood supply in Hebei province blood centers through investigating the basic situation of the department of blood supply in 12 blood centers of Hebei province in order to provide reference for the construction of the department of blood supply for the future.

Methods: Questionnaires were sent out to the 12 blood banks in Hebei province. The contents of questionnaires included the amount of annual RBC and apheresis platelet and plasma and cryoprecipitate sent out, inventory level per day, the maximum amount of storage capacity for the qualified product inventory, responsibility of the department of blood supply, the number of staffs in the position and the professional qualifications, size of the working place for the department of blood supply, situation of computer management, the number of hospitals to which the blood was directly delivered and situation of networking with hospitals from 2014 to 2016. Each blood product was calculated based on units, daily working intensity per person was used to reflect the workload of staffs, the size intensity was used to reflect the size of the working place, the boarding days was used to reflect the quantity. The data were analyzed statistically, and P values less than 0.05 was considered to be statistically significant difference.

Results: The inventory level of RBCs decreased year by year, while the inventory level of platelets and plasma increased year by year. There were serious deficiencies in the storage space for plasma in the province. The professional qualifications of the staffs in the blood supply position or in the management position were seniort. There were statistically significant differences in the working intensity per person in the blood supply position and the intensity of size of the working place for the department of blood supply between the other blood banks in the province and Hebei Province Blood Center (P<0.05), and the working intensity of the staffs in Hebei Province Blood Center topped the list among the blood banks in the province.

Summary/Conclusions: Plasma backlog problems are serious in each blood bank, and these problems appeal to the nation who can provide support in aspect of the policy. The staffs in the blood supply position should strengthen the professional knowledge training for blood transfusion and provide advice and guidance service for scientific rational clinical use of blood in addition to the simple blood delivering job. Installing RFID system in the department of blood supply is an effective defensive measure from the point of system management mistakes and effectively guaranteeing the safety of blood in all the blood banks regardless of the grade.

P-048
ANALYSIS OF STORAGE PERIOD OF LEUKOCYTE-REDUCED RED BLOOD CELLS TRANSFUSED IN PATIENTS IN HOSPITALS IN SHIJIAZHUANG AREA
F Zhao
Hebei Province Blood Center, Shijiazhuang, China

Background: The scope of blood supply for Hebei Province Blood Center includes more than 100 hospitals in whole areas of Shijiazhuang. The Center sends out blood products strictly based on the distribution principle "first in, first out". Storage days and scrapped blood units of RBCs transfused in patients in the hospitals requiring blood supply by the Center are collected and analyzed statistically from 2013 to 2016 to assess the blood supply ability of Hebei Province Blood Center, the degree of the transfused blood and the management level of blood inventory plan in hospitals, and to provide the reference data and prescriptive recommendations for reasonable regulation of RBC inventory turnover volume and standardized blood distribution principle in the Center.

Aims: Storage days and scrapped blood units of RBCs transfused in patients in the hospitals requiring blood supplied by Hebei Province Blood Center, were analyzed statistically from 2013 to 2016, in order to assess the blood supply ability of Center and the degree of the transfused blood and to provide the reference data and prescriptive recommendations for reasonable regulation of RBC inventory and standardized blood distribution principle in the Center.

Methods: The data of leukocyte-reduced RBCs delivered to hospitals of different grades each year and the storage period were collected, the average storage days of RBCs and different blood groups were calculated and analyzed statistically, and P values less than 0.05 was considered to be statistically significant difference.

Results: The total volume of blood delivered and sent out and amount of data observed (U) were gradually increased over the 4 years. The volume of blood required in hospitals in urban areas accounted for more than 2/3 of the total volume of blood sent out, and the volume of blood required in hospitals in suburban areas accounted for less than 1/3 of the total volume of blood sent out. In addition to blood group AB RBCs of which the average storage days were lower in suburban hospitals than in urban hospitals, the average storage days of the other three blood group RBCs were higher in suburban hospitals than in urban hospitals. The average storage days of each blood group RBCs showed a continuous increasing trend year by year. The average storage days of blood group O RBCs transfused were about 18 days, blood group B RBCs nearly 20 days, and blood group A and AB RBCs more than 20 days. The average storage days of blood group A, B, 0 and AB RBCs were 8, 6, 6 and 4 days higher than that on the day of delivery in the blood center, respectively.

Summary/Conclusions: First, RBC inventory is regulated at an appropriate level by the blood center. Second, the blood with a shorter storage period should be selected when delivered to suburban hospitals in order to reduce the delaying effect of the storage period and scrapped rate due to exceeding the time limit. Third, the hospitals make blood inventory reservation plan and haemovigilance mechanism. Fourth, for some patients with special diseases, blood centers and hospitals should consider the distribution principle “last in, first out” in order to ensure the efficacy of blood transfusion for the these patients. Fifth, the center strengthens the supervision degree with respect to the TMIS system specification use in order to obtain more useful data; the department of blood supply supervises the blood inventory of each hospital using TMIS system, participate in the blood regulating between hospitals and minimize the scrapped rate of blood due to exceeding the time limit at the same time.

P-049
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P-050
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P-051
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P-052
HOW TO DEAL WITH THE NEGATIVE PUBLIC OPINION OF BLOOD BANK
X Ge
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Background: In recent years, many Chinese blood banks repeatedly faced negative public opinion crisis that caused the blood donation work encountered Waterloo; blood donor reduced sharply leading to the shortage of the blood supply for clinical use.

Aims: To solve the crisis of negative public opinion of blood bank.

Methods: This paper introduces four principles to cope with the negative public opinion of blood bank: the principle of timeliness, the principle of honesty, the principle of openness and the principle of responsibility.

Summary/Conclusions: There are four effective principles can be done to the crisis of negative public opinion of blood bank.
AN OPTIMIZATION METHOD OF BLOOD SUPPLY WHEN PAROXYSMAL BLOOD DEMAND OCCURS

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Background: Paroxysmal blood demand is often urgent and with large quantity of blood demand. In particular, the paroxysmal accident such as earthquake or war, requires the blood center cooperation so as to guarantee the blood supply. In this case, the blood deployment is controlled by a hub such as National Health and Family Planning Commission (NHFPC) in China. Each blood center is like a node in a social network, and NHFPC is the hub of the network and each blood center is directly connected to and controlled by the hub. However, each blood center also faces blood demand of prior arrangement before the paroxysmal event. So how to get optimize the blood supply of each blood center is important.

Methods: Taking the blood transportation time to the place where paroxysmal event occurs (place) into consideration. Then each blood center’s blood storage subtract the blood demand before the event, and divide by the transportation time of each blood center. This number gives the blood supply per unit time (BSPUT) to the place. Comparing the BSPUT to some threshold which is given by transfusion medicine doctor. Just summing up the “qualified” BSPUT which are more than the threshold. These blood center are called “qualified blood center”. Then figure out the blood center with “non-qualified” BSPUT to the place but “qualified” to the qualified blood center. These blood centers are called “less qualified blood center”. The blood supply from the less qualified blood center can substitute the storage in the qualified blood center. And the steps can be repeated several times until we find the “less less...” qualified center. Summing up all the blood supply per unit time this is the optimized total blood supply per unit time. All the estimation can be valid because of heavy blood shortage. That is why we can use the blood storage in blood centers nearer from the (paroxysmal) place to substitute the blood demand before the paroxysmal event in the blood centers nearer to the place. Numerical simulation is used to check this method. Without loss of generality, we set the “effective” blood storage (blood storage subtract the blood demand before the event) as 1, and the corresponding stochastic storage information are put into the transportation time.

Results: The numerical results shows that then number of our method is larger than that in traditional way. This means that the strategy we proposed is more effective than that in traditional way. And it can avoid the perish of the blood to some extent.

Summary/Conclusions: The optimization of the blood supply when paroxysmal event occurs is more important than simply transferring all the storage in the blood centers. What the hub should do is to calculate the “qualified” BSPUT, rather than simply summing up the storage from each blood center, and to make the “non-qualified” BSPUT in the “non-qualified blood center” “qualified”, since blood shortage is heavy. This way can make the BSPUT more than the traditional method.

USAGE OF CLINICAL APHERESIS PLATELETS THE CENTRAL BLOOD STATION IN HANDAN

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Background: Now more than machine adopt platelets to leukocytes single platelets, the collection process is very strict, stinging arm parts should be strictly sterilized blood donors, blood on the advanced acquisition instrument airtight pipeline circulation and separation, are the use of disposable machine platelet consumables, avoid the cross contamination. The use of platelets is expensive. The retention period of platelet special blood bags for platelets is 7d, so the amount of platelets corresponding clinical dosage is particularly important. Scientifically planning machine adopt platelet collection capacity and inventory, in ensuring clinical under the premise of demand for fresh machine platelets, reduce the cost of the management of blood, put an end to waste blood has the positive significance.

Methods: A mathematical model was established on the clinical supply of apheresis platelets in Handan city every month from January 2007 to December 2011. Data was entered in Epidata 3.0 software. The IBM SPSS statistics 21 were imported. Using the time series analysis method, a mathematical model was applied to predict the supply and demands of clinical apheresis platelets each month from January to December 2014. Errors were detected and analyzed.

Results: Expert model on the determination of usage of clinical apheresis platelets was identified to be the Winters additive model, meaning that residual noises were random noise sequences (P>0.05).Diagnosis was conducted on the model that extracted all the information from the original sequence. Comparison of the predicted results and actual values in 2014, the actual values are falling into a predictive value of 95% confidence interval. Relative errors were small. The model was in its optimal condition.

Summary/Conclusions: Through the establishment of a mathematical model, subsequent data can be help guide blood agencies on the recruitment and collection of apheresis platelets. Science can predict future trends in blood supply and demand.

STANDARDIZED MANAGEMENT PRACTICE OF BLOOD RADIOMETER IN BLOOD STATION

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Background: Blood transfusions have always been a necessary and important means in clinical medical treatment. Using blood irradiation apparatus to irradiate the blood or blood products which are used for transfusion, is the most effective way to prevent the transfusion associated graft-versus-host disease, TA-GVHD. Due to the potential hazards of the radioactive sources used in the equipment, it is particularly important to standardize the management for the blood irradiation apparatus.

Blood transfusions have always been a necessary and important means in clinical medical treatment. Using blood irradiation apparatus to irradiate the blood or blood products which are used for transfusion, is the most effective way to prevent the transfusion associated graft-versus-host disease, TA-GVHD. Due to the potential hazards of the radioactive sources used in the equipment, it is particularly important to standardize the management for the blood irradiation apparatus.

Methods: Take strict management for the blood irradiating apparatus, and establish a clear management organization, corresponding rules and regulations, obtain administrative license, standardized daily management, emergency drill, etc.

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Summary/Conclusions: Take strict management for the blood irradiation apparatus, and establish a clear management organization, corresponding rules and regulations, obtain administrative license, standardized daily management, emergency drill, etc.

INVENTORY MANAGEMENT OF BLOOD SUPPLY

Z Guicui
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Background: With the continuous improvement of medical technology and level, the demand for blood is also increasing. In China, the clinical blood demand increased from 7,563,400,000 ml in 2012 to 8,642,800,000 ml in 2016, with a growth rate of 14.3%. The annual blood consumption recommended by the WHO is 8 ml. At present, the per capita annual consumption of developed countries is more than 20 ml, and about 4 ml in developing countries. But in China, it was 2.9 ml from 2012 to 2015, and there was a great difference between different regions. Large population base, uneven regional development are the reasons for this phenomenon.

Aims: According to the monthly supply of blood in Tianjin Blood Center during the past 3 years (2014-2016), statistical analysis of the most suitable inventory range, and formulate relevant measures, in order to meet clinical needs.
Methods: Using computer systems, the amount of blood delivered per month in 2014 to 2016 was measured. Statistical analysis of the data, and draw the change curve, observe the law of change. In 2014, the average monthly supply was 3,523,383.3 ml, the maximum and minimum monthly supplies were 3,779,800 ml and 2,824,000 ml. In 2015, the average monthly supply was 3,544,850.0 ml, the maximum and minimum monthly supplies were 3,813,900 ml and 2,573,900 ml. In 2016, the average monthly supply was 3,558,658.3 ml, the maximum and minimum monthly supplies were 4,005,500 ml and 2,502,500 ml.

Blood supply decreased in January, February, August and September. In the blood shortage months, the inventory is relatively low, the average number of days out of the blood is about 7-10 days. In the other months, the inventory is relatively high, the average number of days out of the blood is about 14-20 days.

Data calculation and arrangement: Sum the average monthly supply during the past 3 years, then divide 90 days. We can get the result-110,076.5 ml. Take the same approach, we can know the other results: 87,782.2 ml and 128,835.5 ml.

Results: The optimum inventory is 1,180,765 ml (118076.5 ml/10 days); The inventory range is 614,475.4 ml (87,782.2 ml/97 days) – 1,803,659.0 ml (128,835.5 ml/14 days).

Summary/Conclusions: Through the above statistical analysis, we can draw up the appropriate inventory scope, and make reasonable blood supply and deployment. Some methods can be used for reference: Develop fixed blood donors. When the amount of blood collection drops or the demand increases, the blood demand of clinic cannot be satisfied, and the blood donors in the team are promptly notified to donate blood. When the total inventory volume is too high, or the proportion of a blood type inventory is too high, we should take the “limited blood collection” measure, or in a timely manner to avoid the occurrence of waste of blood. When the inventory is low, we should report to the superior leadership and departments in a timely manner, and take corresponding measures, such as notification of fixed blood donors, increase Street recruitment, communicate with the hospital surgery scheduled for the medical staff to make the model to encourage blood donation. … in order to adjust the inventory, increase blood inventory, timely to ensure the clinical blood supply. According to the amount of blood collection, reasonable allocation of blood donors, timely preparation for off-season inventory. Reasonable inventory control, not only to avoid waste of blood, but also to avoid the lack of blood supply, affecting medical treatment.

P-057 CURRENT SITUATION OF BLOOD COLLECTION AND SUPPLY IN CHONGQING

D Yang, H Duan, X Guanyu, Z Chen, D Xia, B Qiu, X Liao, C Yang, X Chen and T He

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Background: Chongqing, with a famous name of “mountain city” covered by 76% hills and mountains, is a municipality directly under the central government. In 2016, Chongqing has 3016.55 million resident population and covers an area of 824000 square kilometers, including 38 districts. There are 1 blood center and 17 blood stations respectively responsible for the blood collection and supply tasks in different areas. A blood collecting and supplying service system covering urban and rural areas has been established horizontally to the edge and vertically to bottom. For the past few years, with the rapid growth of the demand of clinical blood, blood supply is facing new pressures and challenges and presenting a normalized trend of tension supply. In order to better understand the current situation of the blood supply and grasp the overall development trend of the blood supply in Chongqing, it is necessary to analyze the voluntary blood donation in Chongqing.

Aims: The research is based on the current contradiction between blood supply and demand in Chongqing, and the current situation of the contradiction development from local and seasonal to structural and normalized. By studying the blood collection and supply service status and the potential need of blood in these medical resources, it is necessary to fund out the suggestions of how to satisfy clinical needs.

Methods: Using cluster stratify for 18 blood services in Chongqing, the data were collected, including information of the blood collection blood supply in clinical, the blood stations performance and so on, and analyzed with SPSS20.0 software.

Results: The blood donation rate and blood collection of the whole city increased. The proportion of blood collects amounts of blood center was nearly half. Blood donation mobilization is based on individual voluntary blood donation, the group donated blood to supplement. The collection model of 400 ml is accounted for the largest. In Chongqing, there are 30 million permanent residents, The number of beds, patients, in-patients, surgical performance and the blood using for patient increased.

The proportion of blood center is more than one-third to more than half. In Chongqing, the whole city medical staffs in the whole city are including a half permanent employees and a half unauthorized ones. The proportion of education level with universities and colleges is up to three-quarters. The proportion of nurses were the largest. Each blood station with 50000 blood collection exceeded the blood center. The cost of whole blood is increases year by year. All blood collection and supply processes of 18 blood centers are performed by information management. The information system has not yet with the network connection with the hospital of blood usage among the city. The Chongqing blood center has its own network with six primary blood centers.

Summary/Conclusions: 1) Blood voluntary donation is unsuitable for the social and economic development. The imbalance of blood collection and supply area is existed among the blood service system. The level of blood collection and blood supply fail to satisfy with the development of medical and the demand of clinical blood use, 2) The number of staffs is not enough to satisfy the needs. Professional education is limited. The positions in different centers are showed big difference. 3) With the increasing blood cost year by year, it affects and restricts the development of blood collection and supply of the blood services. 4) The lack of the whole city’s network on blood information management system affects the deployment efficiency and the trace ability of blood information.

P-058 TENTATIVE EXPLORATION ON THE LINKAGE MECHANISM OF CROSS REGION BLOOD COLLECTING AND EMERGENCY SUPPLY

W Lei

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Background: Blood stations break administrative division limit, to carry out all-round cooperation, is to enhance the regional blood to disasters or accidents emergency rescue capabilities, the important measures for this view with the industry consensus, but in how to establish coordination mechanism, reasonable allocate resources, provide perfect, perfect the cross-regional logistics information network data exchange and the blood effective application and improve the efficiency of collaboration needs to be further study.

Aims: To Guangxi Liuzhou, Liabin, Hechi establish cross-regional blood collecting and supplying linkage emergency safeguard mechanism to explore, in order to in the corresponding region between the blood concentration detection, blood collecting and supplying drill, personnel and technology deployment, important guarantee for the role of blood emergency relief, etc.

Methods: Three adjacent regional blood services leadership in the practice of the long-term cooperation, constantly sum up experience, to reach consensus, is feasible and effective way to agreement, formation of institutionalized work mode. At the same time, the relevant departments and personnel of the blood supply department should be trained to clarify the responsibilities, working methods and the way of completion in the linkage mechanism.

Results: Through three blood stations emergency safeguard mechanism to establish linkage, Guangxi blood center on the lower central blood stations business further playing a leading role, the corresponding region to emergencies blood collecting and supplying emergency disposal ability has been strengthened. For cross-regional maternal emergency blood use, emergency treatment of acute massive bleeding, or some special personnel, such as after chemotherapy in patients with blood, especially in machine, emergency use of rare blood type of blood platelet, play a crucial role. In addition, it is also obvious that the blood supply agencies in the corresponding regions can optimize the blood inventory management and prevent blood waste.

This is especially important for a blood station with relatively small size and low blood inventory to adjust.

Summary/Conclusions: For a short period of time when disaster or emergency blood surging demand, only by a single blood station is difficult to meet the emergency blood supply of accident rescue, should break administrative division limit, according to the nearly is urgent to establish the principle of cross-regional blood collecting and supplying linkage mechanism. Modern blood stations management objectively requires collaboration between blood stations is comprehensive, but to really do a good job in this collaboration, to establish a cross-regional (provincial) blood information sharing platform is very necessary and urgent, it is the significant support of modern information management system of blood stations. Health and family planning committee of Guangxi is building blood information sharing platform, it is completed and put into use, will greatly improve the management level blood collecting and supplying in Guangxi, and to the development of business collaboration between blood stations within the region that provide technical support and broad prospects.

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Quality Management

P-059
FOUR YEARS EXPERIENCE OF A PETITE LABORATORY IN AN EXTERNAL QUALITY ASSURANCE PROGRAMME
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Background: A participation in the inter laboratory comparisons is one of the specific criteria for laboratory accreditation scheme of Malaysia (MS ISO 15189).

This program provides information on overall performance of laboratory services including competency of laboratory personnel, methodology assessment and safety of patient care. Our petite laboratory has participated in the Royal College of Pathologists of Australasia (RCPA) Australia since 2013.

Aims: The aim of the study was to evaluate our four years performance in an external quality assurance programme.

Methods: We performed a retrospective overview on our RCPA test results for four years, from 2013 to 2016. We analysed and documented the test results which include ABO and D Grouping, Direct Coombs’ Test (DCT), antibody screening, compatibility testing and transfusion decision. Antibody identification is beyond our scope of accreditation.

Results: The accuracy of our current method to determine ABO and D grouping was challenged significantly as twice we failed to detect mixed field (MF) reaction on the issued samples in 2013 and 2016 respectively. The former was a sample from post-stem cell transplant patient and the later was from subgroup of A patient. The discordances could be attributed to the insensitivity of tube technique and the inability of laboratory personnel in detecting MF reaction. Nevertheless, we managed to secure concordant results for all tests using gel method which include DCT, antibody screening and compatibility testings. In deciding a transfusion, we were able to give concordant transfusion decision in 95.8% (68/71) of cases but failed in three different occasions.

Summary/Conclusions: These failures have helped us to detect the lack of competency among our young and inexperienced laboratory personnel as we are a new operating laboratory of a new medical centre and the disadvantages of our current tube method. Following this overview, we strongly support our decision in changing our current tube method to gel method as it provides better sensitivity and objective reading as well as a stable result that permits us to read and verify at a later time. For transfusion decision, a good decisive practice has to take in place for a better patient blood management and inventory management. For continuous monitoring of laboratory performance, we strongly recommend our laboratory counterpart to join at least one external quality programme.

P-060
VALIDATION OF BECKMAN PK7300 AUTOMATIC BLOOD GROUP ANALYSIS SYSTEM
W Xia
Laboratory, Tianjin Blood Center, Tianjin, China

Background: To validate the applicability of the capacity on Beckman PK7300 automatic blood group analysis system.

Aims: To validate the applicability of the capacity on Beckman PK7300 automatic blood group analysis system.

Methods: ① According to the recommends of manufacturers and other laboratories, we determined 6 parameters including incubation temperature, reagent red blood cell concentration, sample red blood cell concentration, sample diluents ratio, diluted sample volume, determination parameters. The other 3 main parameters (including incubation time, antibodies of standard serum, dilution of sample plasma) were evaluated with matching experiments. ② The sensitivity and specificity were validated by using of blood types known and special samples which were consisted of unconformity of forward and reverse typing and RhD-samples. ③ The consistency and suspicious rate were validated by compared with microplate technique.

Results: ① The 3 main parameters (incubation time, antibodies of standard serum, dilution of sample plasma) were determined as 60 min, 1:40 and 1:2.5, respectively. ② Using the evaluated parameters, the 3930 samples which known ABO blood group were done forward typing and reverse typing detection. The rates of correct interpretation were >95%. Simultaneously, the 70 cases and 4 cases special samples were detected correctly. ③ The rate of consistency was >95% and suspicious rate was <20%.

Summary/Conclusions: It indicated that the sensitivity, specificity, consistency and suspicious rate of the analysis system can meet the requirements.

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P-061
THE EXTERNAL QUALITY ASSESSMENT OF BLOOD BANKS IN JIANGSU PROVINCE FROM 2015 TO 2016
Y Ji and X Chen
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Background: In 2012, the Ministry of Health and the Standardization Administration of China had issued the new “Blood stations technology operation procedures”. In order to adapt to the new rules, Jiangsu Province Blood Center regulated the "blood services quality control laboratory system of quality assessment (EQAs)". A total of 12 blood banks in Jiangsu Province were on board with the project. After 4 years, makes sense to study the results of the project.

Aims: To investigate whether the quality and detection level of the new system to the whole province blood stations improved, and to analyze the increased comparability test results.

Methods: Quality control samples were allocated to each of the quality control labs for coagulation test (FVIII:C, Fbg) and residual quantity of methylene blue, which were added to the EQA from 2014, and the results were collected for statistical analysis. Reports were sent to each lab in time.

Results: The PT percent of pass of EQA results for coagulation test (FVIII:C, Fbg) and residual quantity of methylene blue in 2015 were 77.77% and 80.00%, respectively. After the evaluation report suggestions were given, accuracy and precision of the quality control labs had obvious progress, according to the results in 2016. Results of all the three items had an obviously up-trend with a 83.33% and 87.50% pass rate.

Summary/Conclusions: The results showed that quality tests of blood are the same important as security detection. It must be run through all aspects of the laboratory quality management. In order to ensure the accuracy of test results, laboratory should regular calibration instruments, pay attention to personnel’s training and continuously improve the quality of laboratory management.

P-062
ESTABLISHMENT AND EVALUATION OF THE INTERNAL QUALITY CONTROL METHODS IN BLOOD NUCLEAR ACID SCREENING SYSTEM
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Background: At present, nucleic acid detection technology (NAT) has been widely popularized, and the internal quality control is of great significance to ensure the reliability of nucleic acid detection results. However, a more unified nucleic acid quality control system has not yet been established between the different blood laboratories. The experimental results are quite different and comparatively poor between different laboratories. Therefore, it is urgent to establish a standardized quality control method for NAT in the laboratory.

Aims: To establish and evaluate the method of internal quality control (IQC) in blood screening by KHB nucleic acid test (NAT) systems.

Methods: The QC standard HBV DNA (200 IU/ml), HCV RNA (2000 IU/ml) and HIV RNA (2000 IU/ml) were diluted with negative plasma for blood donors to the detection limit. The suitable concentration of IQC was determined. The same batch IQC samples were tested 20 times, and the mean (x), standard deviation (SD) and coefficient of variation (CV) were calculated. With x ± 3SD as warning, x ± 3SD as rejected, the NAT screening QC frame was established and analyzed. The Levey-Jennings QC chart was drawn, the IQC results were analyzed 180 times and the feasibility and effectiveness of internal quality control model were evaluated using the Westgard multi-rule QC method.

Results: Take the HBV as an example, the correlation coefficient between IQC and CT value was r = -0.920, which was highly correlated at P = 0.05 level. Selecting a concentration of 100 IU/ml of IQC, the same batch IQC samples were tested 20 times, x was 31.76, SD was 1.10, and CV was 3.46%. And the same batch IQC samples were tested 180 times continuously, x was 32.02, SD was 1.13, and CV was 3.53%.

Summary/Conclusions: It is feasible that the CT value was used in NAT IQC. Weak positive IQC selected by our laboratory can enhance the reliability of the experimental results, and it also can eliminate the error caused by the staffs and other experimental conditions changes, so as to monitor the effectiveness of the nucleic acid extraction and amplification detection.
P-061

Abstract has been withdrawn

P-064

THE DISCUSSION ON THE MANAGEMENT MODE OF UNPAID BLOOD DONORS WHO WERE TEMPORARILY DEFERRED IN HAINAN PROVINCE

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The Blood Centre of Hainan Province, Haikou, China

Background: As the contradiction between the increased blood volume for clinical use and the difficulties of unpaid blood donation recruitment increased year by year, under the condition of the blood tests ability to constantly improve, it is necessary to effectively manage for the temporarily blocked unpaid blood donors, follow up detection, and provide personalized follow-up services, to retain, consolidate and reduce the loss of blood donors.

Aims: To establish a computer system of effective management for unpaid blood donors who are temporarily deferred, provide a basis for the temporarily deferred donors to reenter and unify the process, and also provide quality follow-up services for the reentered blood donors.

Methods: The temporarily deferred blood donors states of blood donation were identified in their profiles in our province, and make them in the state of unable to collect whole blood but only can collect he blood specimens, the specimens can be collected in any blood collection points of our province to follow-up detection, and every time the test results were recorded in the blood donation profile, if the serological and nucleic acid test are qualified after two times tests with each method, their rights of blood donation can be restored.

Results: There were 2935 qualified specimens after the test of 3446 reentered blood specimens (85.2%). Among them, 840 of the 990 reentered specimens due to the reactivity of HBsAg were qualified (84.8%), 589 of the 659 reentered specimens due to the reactivity of Anti-HCV were qualified (87.6%), 603 of the 715 reentered specimens due to the reactivity of Anti-HIV were qualified (83.6%), 320 of 365 reentered specimens due to the reactivity of Anti-TP were qualified (88.1%), 120 of 365 reentered specimens due to the reactivity of NAT were qualified (87.8%).

Summary/Conclusions: Through the information system of modern blood station management (SHINOW9.0) for the temporarily deferred blood donors, the whole process of the identification, collection and testing results of the reentered donors was effectively managed, the loss of blood donors was reduced, and it was beneficial to the result consultations of blood donors and the follow-up care services.

P-065

ANALYSIS OF THE PROBLEMS WHICH WERE FOUND IN THE SITE INSPECTIONS IN 2016

Y Cui and F Zhao
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Background: Because blood collection and supply work is a repetitive task and it starts from scratch every day, the error is unavoidable. Blood stations have different management model for error management. Our Blood center takes standardized operational inspection as the core of patrol as an important measure of site management and process control. The business department set up a special position and personnel, in charge of monthly site patrol of 24 blood collecting and supply departments and sites, focusing on implementation of operating procedure and evaluation of training effectiveness. The problems found in sites should be communicate with the staffs and keep records, the problems which needed to be coordinate should be reported to the relevant management department and urge to solve as soon as possible, the problems which found in the patrol should be collected and feedback to the responsible departments, and linked to performance appraisal.

Aims: To analyse of the problems which found in the site inspections in 2016 from the center, to seek appropriate countermeasures to promote the continuous improve- ment of quality management system of blood collection and supply.

Methods: By summarize site inspection records and find problems according to quality management elements and analysis method, to propose the countermeasure, and then according to the five elements of man, machine, material, method and environment to classify and analyse from the aspects of quantity and proportion in 2016.

Results: Personnel factors account for the largest proportion, the second one is process.

P-066

STATISTICAL PROCESS CONTROL ANALYSIS TO VOLUME OF RED CELLS IN ADDITIVE SOLUTION

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Background: Statistical process control (SPC) is used to monitor the performance of blood component collection and production processes in the UK and elsewhere. (Quality requirements for whole blood and blood components (GB18469-2012) In china require the volume control ranges for whole blood are 200 ml±20 ml, 300 ml±30 ml, 400 ml±40 ml, and the volume control ranges for red cells in additive solution are labeled ml (±10%). There are differences in the separation and preparation process of blood components in elsewhere, and part of the quality characteristics of blood components products depend on the biological characteristics of local donors. There is no definite quantitative standard for the qualified range of suspended red blood cell, so that the capacity control of quality sampling is lack of definite basis.

Aims: The volume index of red cells in additive solution collected from Urumqi blood center was analyzed by statistical process method. Assess the extent to which capacity control occurs during the operation of blood collection and processing in Urumqi blood centre. Identify possible problems in the monitoring process and generate signals to analyze the continuous quality performance of the monitoring process.

Methods: Red cells in additive solution was prepared by the whole blood that was centrifuged by hand split. The volume was calculated by random sample weighing, dividing by product density, after deducting plastic blood bag skin weight. The product volume data of 1U, 1.5U and 2U were statistically analyzed with Minitab software.

Results: The volume values of 3 sizes of red cells in additive solution were 151 ± 9.93 ml, 227 ± 11.95 ml, 304 ± 13.51 ml, and the volume values all accorded with the normal distribution. The Cpk of 1U, 1.5U and 2U red cells suspension control in the volume range of ±10% (0.9, 1, 1) were higher than in range of ±10% (0.50, 0.64, 0.74). The detection sensitivity of the CUSUM control chart is higher than that of the Shewhart control chart.

Summary/Conclusions: The capacity of volume control for 1U red cells in additive solution was relatively poor, which may be related to the sex distribution of the sampling donors. The ability to control the volume of the suspended red blood cells should be improved. The data of CUSUM control graph still needs to accumulate, to fix the frequency and number of sampling and optimize the related parameter setting.

P-067

STUDY ON FUNCTIONS OF PROVINCIAL BLOOD CENTER ON REGIONAL BLOOD QUALITY MANAGEMENT

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Background: In China, there are over 430 independent Blood Transfusion Services (BTSs) under the jurisdiction of local governments at different levels. A BTS belongs to provincial government named Provincial Blood Center, while a BTS belongs to local government named Central Blood Bank or Blood Bank. The testing proficiency and the blood quality of local blood banks were limited by the relatively poorer management and less professional experience. Although most of blood banks have already established quality assurance system, there are still a lot of problems in quality internal audit in local blood banks. Law has been regulated that provincial blood center has the duties on business guide for local blood banks on regional blood quality. But faced on numerous local blood banks with broad diversity, how could a Provincial Blood Center effectively fulfill the duties, especially for those blood banks without any administrative relationship?

Aims: To share the experiences from Jiangsu Provincial Blood Center on how to develop the functions on regional blood quality management.

Methods: A blood quality management system covered 18 blood banks all over the province has been established. The system is including 3 parts, a provincial EQAS
for quality control laboratories, a joint blood quality internal audit mechanism, and quality control business and technique training for the technicians from blood banks. Blood screening ELA testing (HbAg, Anti-HIVV1/2, Anti-HCV and syphilis serologic testing), biochemical quantity testing (ALT, Total plasma protein, Sodium ion and Potassium ion, Methylene blue), blood cell quantity testing (Hb, Hct, Count of WBC, RBC and PLT) and blood coagulation quantity testing (Eighth coagulation factor and Fbg) were included into EQA programs.

Results: Most of laboratories achieved good results in EQA, except for some laboratories had some problems on biochemical quantity testing and blood coagulation quantity testing, EQA can improve the testing proficiency of blood quality laboratory of blood banks, and blood quality can be improved based on the strict and accurate quality testing by blood quality control laboratories. The joint blood quality internal audit mechanism can help to enhance the function of internal audit for finding the potential problems of the blood banks. The training, of course, was good for improving ability of the staffs on blood quality control and management.

Summary/Conclusions: Although the blood quality management system still need further improvement, Jianguo Provincial Blood Center has found a good way to enhance the functions on blood quality guidance for regional blood banks.

P-068 TRENDS ANALYSIS OF LEUKOREDUCED ERYTHROCYTES BY RATIO ANALYSIS
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Background: The 2012 edition of "technical regulations for blood stations" puts forward the trend analysis of the sampling results of blood quality control, but the specific methods of trend analysis are not clearly defined.

Aims: The ratio trend analysis method is used to unify the test results of different items by ratio conversion, and the variables of different items are drawn in one graph. Through horizontal comparison with blood between different projects, and longitudinal comparison of varieties of blood, the complex and tedious variable relationship will be reflected simply. Through analysis the change of each variable trends in chart, the risk and the problem among them will be found, it may offer some guidance of blood collection, preparation, testing, provision, so as to help improving the blood quality.

Methods: Standard deviation rate = (measured value-standard value)/standard value × 100%, where standard rate = zero baseline value. Take the blood bar code as the abscissa, deviation standard rate as the ordinate, draw broken line trend chart. According to the "Blood and blood components quality requirements ", the exchange rate of leukoreduced red blood cells as the standard of quality control: capacity (±10%), hemoglobin (Hb) content is more than 0, hematocrit (HCT) (±14%), residual leukocyte is less than 0, the final storage hemolysis rate <0.

Results:According to the 2016 ratio trend chart of leukoreduced erythrocytes quality control data, all the items meet the requirements except that the capacity of data appeared to exceed interval for 19 times. Among them, the capacity has negative deviation with 40% data beyond interval, combined with the blood volume trend positive deviation and steady trend line analysis that the filter manufacturers, maintenance liquid categories and changes of preparation process which lead to the high capacity internal control standard of current set. At the same time, during the blood preparation process, the residue in the filter and the multi bag catheter, the two centrifugal loss in the plasma preparation are also factors of negative deviation. Hb content present positive deviation which indicates that the blood donors’ health consultation is reasonable. At the same time, the quality control standard of blood Hb content is low because it is far away from baseline. The HCT trend was stable and distributed on both sides of the baseline, indicating that the blood donors’ health consultation and component preparation is reasonable. Negative deviation and away from the baseline of leukocyte residual indicate that leukocyte filtering link is reasonable, while because of the detection method of blood storage time, the changes of leukocyte morphological, personal experience and different skills of operators, which all result in high fluctuations of the trend. Comparing with the whole blood, the trend fluctuations of the final hemolysis rate in leukocyte suspending erythrocytes is bigger. Considering the preservation of blood, the filtration of ingredients and the plasma fractionation, which all cause damages in red blood cells.

Summary/Conclusions: Using ratio analysis method to analyze the trend of component blood, which can not only be classified according to blood type, but also classified by human, machine, material, method, surroundings, a variety of complex relationship. It can make presentation easily and concisely in one trend map. It not only fully improves application efficiency of the quality control results, but also provides help for improving the quality of blood preparation.

P-069 THE REGULAR MAINTENANCE AND CALIBRATION OF BLOOD STATIONS SEMI-AUTOMATIC BIOCHEMICAL ANALYZER ROLE IN LOWERING BLOOD ALT SCRAP
L Peng
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Background: Current semi-automatic biochemical analyzer has been done in various blood stations before donating blood ALT screening applications, no matter dry or wet all achieved good effect, greatly reduces the for ALT unqualified cause blood collection and scrap. The standard of the 2015 version of blood station technical operation procedure for the determination of alanine aminotransferase is "ALT no more than 40 U/I to be ALT no more than 50 U/I", and this adjustment will also greatly reduce the failure rate of ALT. Currently, there are many reports on the comparison of biochemical analyzer, and the results are very good. However, there is no uniform method for the problems of the subsequent use of semi-automatic biochemical analyzer. We adopted the methods recommended in the CLSI ep15-a guide, gave us a good effect for nearly five years of experiments on 16 semi-automatic biochemical analyzers.

Aims: In order to reduce the blood for ALT unqualified scrap rate through regular maintenance and calibration of a semi-automatic biochemical analyzer.

Methods: Every 3 months CLSI EP15 – A guidelines recommend method for validation: 5 day, an analysis of a day, daily 2 levels, each level the same specimen repeat 3 times. If because of the quality control program, or operation to a batch is out of control, eliminating data, and perform additional batch. The operator shall be carried out in accordance with the manufacturer specification operation.

Results: After nearly five years of experiment semi-automatic biochemical analyzer was found after every 3 months of maintenance and maintenance, ALT of scrap rate continues to decrease 5.15%(p = 0.001) and 2.14%(1 637/76 313) 2.22% (759/79 232) 1.57% (228/78 238) 0.68%(57/84 406) (P < 0.01).

Summary/Conclusions: The CLSI EP15 – A guide to methods recommended by regular maintenance and calibration for semi-automatic biochemical analyzer could have a effectively control blood ALT scrap rate, which is worthy of reference for colleagues.

P-070 COMPARISON OF 3 PRETREATMENTS FOR ELIMINATION HYPERLIPIDEMIA ON THE DETECTION OF ALT
W Xia
Laboratory, Tianjin Blood Center, Tianjin, China

Background: To assess the function of 3 different pretreatments for reducing the interference on the determination of ALT in the hyperlipidemia blood samples.

Aims: To assess the function of 3 different pretreatments for reducing the interference on the determination of ALT in the hyperlipidemia blood samples.

Methods: (1) To detect ALT and triglycerides (TG) concentrations of the different simulation lipid blood specimens. (2) The ALT of high concentration of lipid sample (lipid concentrations of more than 5 %) was detected that were pretreated by 3 different pretreatments, the results showed no significant different between PEG and ultracentrifugation and original value, but the ALT of lipid concentrations of more than 5 % to be ALT no more than 50 U/I”, and this adjustment will also greatly reduce the rate of ALT. Currently, there are many reports on the comparison of biochemical analyzer, and the results are very good. However, there is no uniform method for the problems of the subsequent use of semi-automatic biochemical analyzer. We adopted the methods recommended in the CLSI ep15-a guide, gave us a good effect for nearly five years of experiments on 16 semi-automatic biochemical analyzers.

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P-071
RETROSPECTIVE ANALYSIS OF EQAS RESULTS ON BACTERIAL TESTING IN JIANGSU BLOOD BANKS FROM 2015 TO 2017
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Background: Bacterial testing is one of the sampling observation programs of blood products in blood banks in China. Due to the small number of sampling per month and the enforcing strict disinfection procedures before blood donation, lots of blood banks have not detected bacteria over the years. CITIC EQAS on Bacterial Testing can answer the question about the reliability of results. From July 2015, 12 blood banks in Jiangsu Province had participated in CITIC Bacterial Testing EQAS.

Aims: To summarize and analyze the results obtained from CITIC EQAS on Bacterial Testing for Blood Screening from 2015 and 2017, and to improve bacterial detection performance in the quality control laboratory of 12 blood banks in Jiangsu Province.

Methods: The EQA samples were tested and results were reported from July 2015. The bacterial strains from the positive culture flasks were identified. The results of 12 blood banks' laboratory were summarized and compared with the expected results. The timing of the positive results was also analyzed.

Results: Five batches of bacterial strains samples were detected by 2017. Two false positive results and three false negatives results were identified. The coincidence rate were gradually increased from 96.6% to 100%, while the variable coefficient range of the detection time of the positive samples were 8.4% to 38.1%.

Summary/Conclusions: Participating in the CITIC EQAS on Bacterial Testing for Blood Screening is helpful to determine the factors leading to false negative and false positive results and to improve the accuracy and reliability of bacterial detection. The retrospective analysis of EQAS results facilitates the standardization of specifications in the testing process.

P-072
RISK ANALYSIS AND CONTROL OF REGIONALIZED CENTRALIZED NUCLEIC ACID DETECTION
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Yunnan Kunming Blood Center, Kunming, China

Background: In 2015 December Yunnan Kunming Blood Center began to nucleic acid centralized detection of Yunnan Province, this research explore that how to safely and effectively carry out the centralized testing.

Aims: Establish and improve the quality system of centralized detection by the risk analysis and risk control. To ensure the smooth implementation of centralized detection, and to explore the application of risk management in the centralized detection process.

Methods: Formulate a index matrix of risk evaluation, Identify the risk points that may occur during centralized detection, put forward risk control measures, reduce the risk of centralized detection.

Results: Divided into three levels of risk points to acceptable risk, increased risk and unacceptable risk by the index matrix of risk evaluation, develop appropriate control measures for different levels risk. Retrospectively analyze the effect of control measures we found that every point residual risk is reduced.

Summary/Conclusions: Establish and improve the quality management system which form conform features of centralized detection and key process, can reduce the detection risk caused by various reasons. To ensure implemented centralized detection with high quality, efficient and orderly manner.

P-073
THE INTERVAL ANALYSIS OF THE IDENTIFIED/RESOLVED RESULTS OF THE TESTS IN TWO NUCLEIC ACID DETECTION SYSTEMS
J Zhang
The Blood Centre of Hainan Province, Haikou, China

Background: Most blood services are currently carrying out the nucleic acid detection technology, nucleic acid detection technology has improved the detection sensitivity, at the same time, also inevitably produce false positives, cause the waste of blood to resources. The identification/resolution rates of the e-n⁺ are generally not high. This paper aims to analyze whether the identification/resolution rates of the e-n⁺ are different in different intervals.

Aims: To analyze the signal ratio (SR) and CT value distributions of the test results of Grifols Procleix TIGRIS system and Shanghai haoyuan CHitas Bss1200 system, and provide the basis of increasing the rate of E-N⁺ identification/resolution and perfecting the detection strategy.

Methods: A nucleic acid test was conducted for the 102136 serology negative samples of the blood donors from January 2016 to December 2016, using the detection systems of Procleix TIGRIS and CHitas Bss1200, the reactive samples in the first test were identified/resolved, and analyze the results according to the intervals.

Results: The identification rate of the group of $15 \leq \text{SR} < 20$ was significantly higher than that of the group of $10 \leq \text{SR} < 15$ (P<0.05) in the Procleix TIGRIS system; the resolution rate of the group of $39 \leq \text{CT} < 41$ was significantly lower than that of the group of $37 \leq \text{CT} < 39$ (P=0.05), there was no statistically significant difference between the group of $35 \leq \text{CT} < 37$ and $37 \leq \text{CT} < 39$ (P > 0.05).

Summary/Conclusions: The identification/resolution rates of two nucleic acid detection systems have significant differences in different intervals, it is necessary to follow up these blood donors and verify, perfect the detection strategy and increase the identification/resolution rate.

P-074
APPLICATION OF TREND ANALYSIS IN THE STATISTIC ANALYSIS OF THE BLOOD QUALITY CONTROL.
W Li
Jiangsu Province Blood Center, Nanjiang, China

Background: It has been stipulated in Blood Station Technical Operation Procedure since 2012, that the trend analysis should be carried out for the sampling results of blood quality control, however, the analysis method is not specified. For apparent volume results, the mean value of monthly weighing data can be calculated to draw a line chart with an error bar for trend analysis. For sampling that needs to open blood bags, such as Hb and Hct in red blood cells in additive solution leukocytes reduced, etc., eligibility is currently determined by equal to or greater than 3 bags of qualified products in 4 bags of detected products. Due to small sample size, this determination method lacks persuasiveness. In this paper, results were determined by the t-distribution table, P25 values of monthly data were calculated to draw a line chart, and trend analysis was conducted after combining with the scatter diagram drawn using monthly data.

Aims: Taking the statistical analysis of the quality control data of red blood cells in additive solution leukocytes reduced as an example, the application of trend analysis in quality control was illustrated.

Methods: The quality control items for red blood cells in additive solution leukocytes reduced including Hemoglobin (Hb) content, Hematocrit (Hct) and apparent volume data were detected and extracted, a scatter diagram and a line chart were drawn to describe the trend of numerical changes, and monitoring was performed based on the trend chart.

Results: Results of each quality control item for blood cells in additive solution leukocytes reduced were qualified. P25 value of monthly Hb content was greater than 18 g/L, showing a slight increasing trend. Hct showed deviations twice which were determined as qualified by the t-distribution table, with a trend fluctuating within the qualified range. Monthly data of apparent volume fluctuated up and down around the labeled amount.

Summary/Conclusions: Trend analysis can be effectively applied in quality control.

P-075
DYWERY PRESSURE MEASURING INSTRUMENT USED IN BLOOD STATION NUCLEIC ACID LABORATORY PRESSURE MEASUREMENT
W Jie
Wuhan Blood Center, Wuhan, China

Background: Blood station nucleic acid testing laboratory pressure system is an important guarantee to prevent contamination of nucleic acid laboratory. Most blood stations now rely on laboratory pressure gauges to display laboratory pressure. In this paper, effective real-time monitoring of nucleic acid screening laboratory pressure gradient, Verify the effectiveness of the pressure display system installed in the laboratory, Prevention of laboratory pollution caused by stress systems.

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Aims: After establishment of quality analysis system, to identify problems and potential risks through dynamic monitoring of the whole process of the blood collection and blood supply, and take timely measures to achieve continuous improvement and explore the role of quality analysis meeting plays in improving quality management levels of blood station.

Methods: Problems and potential risks were detected through weekly, monthly and yearly three-level quality analysis during the whole process of blood collection and supply, rectifications were made or preventive measures were taken.

Results: Problems and influencing factors were detected through quality analysis and improvement plan was raised to ensure the quality of blood and promote the continuous improvement of quality management system. The scrapping rate of each index was significantly reduced ($P < 0.01$), saving valuable blood resources and ensuring blood quality.

Summary/Conclusions: The application of quality analysis meeting in quality management of blood station makes the data analysis of each work an important means for improving quality control basically qualified, there is still room for improvement.

P-079
THE ANALYSIS OF 69 CASES OF POOR QUALITY BLOOD SPECIMEN
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Background: Unpaid donors to donate blood, the quality of blood specimen is very important, such as blood specimens does not comply with the requirements, directly affect the quality of the finished product. The results directly impact the quality of blood supply. The results directly affect the quality of the finished product.

Aims: To improve the rate of non-conformity of the quality of non-remunerated blood donors and their causes.

Methods: I stand in the 69 cases of substandard blood samples collected from May 2011 to May 2016, and all the relevant professionals are examined and analyzed for the reasons of deferral.

Results: The causes of poor blood samples were analyzed, 40 of them were specimens of hemolysis, accounting for 58.0%. 12 cases of fat blood, 17.4%; Seven cases were inadequate, accounting for 10.1%, and six for test tube tags, accounting for 8.7 percent. Four cases of untimely centrifugation (test tube) were 5.8 percent.

Summary/Conclusions: In blood transmission of CaiGongXie system disease, blood specimen collection and test process is a very important basis. In the process of blood specimen collection, need each of standard operation procedures, to ensure accurate test results.
Blood Donor Recruitment

P-081
THE STATUS AND NEW TRENDS IN ADVERTISING AND RECRUITMENT FOR VOLUNTARY NON-RENUMERATED BLOOD DONATION IN CHINA

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Background: With the development of medical technology and the implementation of the policy of universal health care in China, the demands on blood for clinical use have presented a gradual increase as well. Although the blood supplied by medical institutions of different regions keeps rising, the rate of blood donation in China up to now is only 10\text{\text{\%}}, and the growth rate of blood supply is still slightly lower than that of blood demands. Meanwhile, the regional and seasonal blood shortage happens from time to time, which indicates that the blood shortage has become the main challenge that all blood donation and supply institutions need to face.

Aims: To provide a safe, adequate and effective blood supply for clinical use by strengthening the advertising and recruitment for voluntary non-remunerated blood donation, and attaching the importance of the innovation of new theories and practices for the blood donors’ recruitment and service.

Methods: Apart from laying emphasis on different methods of advertising and recruitment of blood donors, such as news report, blood donation publicity on streets, telephone and messages as well as volunteers’ advertising, all blood donation and supply institutions are supposed to create new methods by joining hands with Wechat, Microblog, brand projects, such as brand Items “Red Summer” and “Warm Winter held by Beijing Red Cross Blood Center since 2009”, “Red Action” at Shen-zhen Blood Center since 2011 as well as the brand licensing activities at Shanghai Blood Center since 2014.

Results: Among the voluntary non-remunerated donors, the number of whole blood donors rises from 11.890 million in 2012 to 12.915 million in 2016, the growth rate of which is 1.08%,1.31%,1.89% from 2013 to 2016 each year, and the units of whole blood rise from 20.017 million U in 2012 to 21.513 million U in 2016, the growth rate of which is 0.52%,1.77%,1.65%,3.35% from 2013 to 2016 each year. Meanwhile, the number of blood component donors rises from 0.67% million in 2012 to 0.949 million in 2016, the growth rate of which is 12.30%, 8.44%, 7.79%, 7.11% from 2013 to 2016 each year, and the units of blood component rise from 0.965 million U to 1.477 million U, the growth rate of which is 18.13%, 9.66%, 9.84%, 7.57% from 2013 to 2016 each year. The amount of blood donation in China has been increasing steadily, among which the donation of whole blood speeds up while the blood component slows down a little.

Summary/Conclusions: Centered on blood donors, scientific and effective advertising and recruitment, which plays a pivotal role in solving the problem of blood shortage, are greatly advised to make full use of traditional and new media, brand project and licensing activities. Additionally, it has become a trend that the future recruitment, which aims to attract growing social participation and support, will be distinctive owing to the unique features of local conditions. Besides, making appointment to donate blood may become a reality in the near future.

Blood Donation – Blood Donor Recruitment

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Blood Donation

P-082
IRON DEFICIENCY AND ANEMIA AMONG BLOOD DONORS IN CHINA

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Background: Iron deficiency is a global health issue estimated to concern as many as 2.7 billion people and explain half of the cases of anemia worldwide. Iron deficiency in blood donors is taken more attention in developed countries due to the interval and frequency of whole blood donation. In China, the interval of whole blood donation [WBD] is six months and the minimum hemoglobin (Hb) level is 115 g/l for women and 120 g/l for men. No report on iron deficiency as a result of a whole blood donation in China is available.

Aims: This study aimed to estimate the prevalence of iron deficiency in voluntary blood donors and provide basic data to determine whether it is reasonable to shorten the interval of WBD in Jiangsu, eastern China.

Methods: The study was conducted at the mobile vehicles in Jiangsu Province Blood Center and involved 149 men and 80 women who passed the Health Check Questionnaire including of Hb level by copper sulfate assay. Serum ferritin was determined by ELISA kit (Elabscience, China) on Hamilton ELISA working platform (SRAR line, Switzerland) and red blood cells (RBC) parameters of complete blood count was determined by a hematology analyzer (SYSMEX KX-21, Japan). We have analyzed the correlation between the RBC parameters (RBC count, Hb, HCT, MCV and RDW).

Results: After passing the Cu2SO4 assay, Hb level of the male donors were all up to grade by hematology analyzer and the average was 149.36 g/l. All of them had normal RBC count, HCT and RDW, only one of them had low MCV (70 fl). The average Hb level of woman donors was 127.93 g/l and there were lower than criterion (1 was 99 g/l and 2 were 110 g/l). Among them, only 1 with low ferritin level (0.67 g/l) and MCV (78.6 fl) was anemia. All of them had normal RBC count and RDW. Seven of them had low HCT (<10%). The prevalence of iron deficiency (ferritin < 12 µg/l) was 8.00% (18/225), 13 were female and 5 were male. Iron deficiency prevalence between them was significantly different ($x^2 = 14.38$, $P = 0.0001)$. No difference in iron status was between the first donation and repeat donation.

Summary/Conclusions: Iron deficiency and iron-deficiency anemia prevalence are not higher than expected and that of other countries in current donation interval in China. It should be pay more attention on iron deficiency of female donors. Further investigation need to observe whether the prevalence of iron deficiency and anemia increase after the interval is changed to three months, especially among regular blood donors and female blood donors.

BLOOD DONOR HEALTH AND DONATION SAFETY OF HEMOVIGILANCE IN THAILAND

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Background: Making safety of blood donation is major role. A significant disadvantage of blood donation is the potential risk of iron deficiency. Blood donation leads to iron loss, as about 0.5 mg iron is lost per each milliliter of blood donate.In Thailand iron deficiency is a common public health problem, and the various thalassemia and hemoglobinopathies are prevalent.

Aims: This paper aims to study the integrate the serum ferritin determination, and the thalassemia trait with hemoglobinopathy screening program to improve a donor health and safety donation in routine hemovigilance program in Thailand.

Methods: The volunteer Thai blood donors 49 male and 80 female donors were pre-screened for Hb determination by Hemocue. The thalassemia trait with hemoglobinopathy screening program to improve a donor health and safety donation in routine hemovigilance program in Thailand.

Results: In 129 individuals it was found 20.15% of non acceptable blood donation that depleted iron stored, DIS ($S < or = 15 ng/ml) was found 69%. Interestingly, the acceptable blood donation was found DIS 35.12% which Hb E trait 13%,beta thala-ssemia trait 2.91% and hereditary persistence of fetal hemoglobin (HPFH) 1 case.

Summary/Conclusions: This paper could suggest that integration of determination iron store status and thalassemia trait and hemoglobinopathy examination are necessary to be an additional tests of routine blood donor screening in Thailand.
P-084
INTERVENTIONS TO PROMOTE BLOOD DONATION IN NON-REGULAR DONORS-A SYSTEMATIC REVIEW
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Background: The recruitment and retention of blood donors are the key to blood safety and sufficiency worldwide. Evaluating interventions promoting blood donation is a prerequisite for motivating blood donors. Given the different determinants of donation behavior between high baseline motivation and low baseline motivation donors and that two-thirds of first-time donors would stop after their first donation, it is much more meaningful to motivate non-regular donors to become regular donors.
Aims: To evaluate the effectiveness of interventions promoting blood donation targeting non-regular donors with low baseline donation rate.
Methods: Data sources: Pubmed, CINAHL, EMBASE, Cochrane, Psychnfo and the reference list of previous reviews. The search strategy consisted of five key words with their variations: randomized trial, blood, donor, intervention and promotion. In all databases, keywords are combined by Boolean operators “AND”, “OR” and “NOT” (transplantation related studies were excluded using “NOT”). Study eligibility criteria: only RCT or quasi-experiments are included, population are non-regular donors including potential donors from the healthy population, novice donors (1 to 4 donations), temporarily deferred donors and lapsed donors. All interventions targeting blood donation promotion are included, outcomes should include donation behavior or incidence of negative reaction, language is English. Study appraisal is done using the Jadad score. The original 2 × 2 table was used to calculate OR. Heterogeneity was analyzed using a z2 test (Cochran’s Q) and I2 pooled effect sizes [8] were calculated in subgroups with at least 3 interventions using R.
Results: There were totally 7192 studies identified, 24 studies with 35 different interventions (S = 35) were included in the review ultimately. “Cognitions based” group (S = 11, pooled OR = 1.74, 95% CI [1.17, 2.57]) and “Reminder” group (S = 3, pooled OR = 1.55, 95% CI [1.30, 2.86]) showed significant effect with small effect sizes (Cohens’d in each group were less than 0.20). “Altrums” group (S = 8, pooled OR = 1.30, 95% CI [0.99, 1.71]), “Measurement of cognitions” group (S = 4, pooled OR = 1.08, 95% CI [0.98, 1.20]) and “Incentive” intervention group (S = 4, pooled OR = 1.22, 95% CI [1.07, 2.05]) had insignificant effect. More studies with high validity were needed to draw conclusions in the remaining three groups with five interventions.
Summary/Conclusions: This review includes four types of donors sharing the common characteristic of low baseline donation rate or having not formed the habit of blood donation in other words, so that they all should be a target of promotion. But there are three limitations including small number of studies in three categories, relatively high heterogeneity in three groups and low Jadad scores in some studies, which implies that validity needs to be improved in future studies. This review finds that “Reminder” and “Cognition based” interventions are two effective interventions. As for interventions of “Modeling”, “Foot-in-the-door/door-in-the-face”, each subgroup in behavior intervention and “Implementation intention”, more studies with high validity are needed to draw conclusions about their effectiveness in promoting blood donation among non-regular donors due to the limit number of study.

P-085
Abstract has been withdrawn

P-086
ANALYSIS OF DONORS GIVING BLOOD AT FIXED SITES AND THROUGH MOBILE CAMPAIGNS, WITH THE AIM TO DEVELOP A STRATEGY FOR EFFECTIVE DONOR RECRUITMENT AND RETENTION
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Background: Increased aging population could cause imbalance of need and supply of blood in the near future; therefore, making efforts to increase donation rate of young adults and increase regular donors in the donor pool are mandatory. Previous studies indicated that there were differences in donation patterns between donors donated in fixed site and mobile site. To suggest effective strategies for recruiting and retaining donors, we need to know the characteristics of donors donating at different donation sites.
Aims: 1. To characterize blood donors donating at different donation sites in Taiwan. 2. To develop a collecting strategy for blood centers, aimed at long-term development, in keeping with a proper contribution of blood between first time and regular donors.
Methods: Donors who donated whole blood (WB) at least once in 2014 were included in the analysis. The type of donation sites were classified into three groups: fixed sites (FS), donation campaigns such as social groups, companies or other organizations held in mobile sites (MO), and donation campaigns at the military camps or the schools held in mobile sites (MMS). The distribution of donor types (including the first-time donors in 2014, the regular donors who donated blood at least twice in recent two years, and the returning donors who did not donate blood in 2013 but returned in 2014), averaged number of WB unit per donor, and the first and second return rate in two years among the first-time donors were calculated by the type of donation sites. Multiple logistic regression analysis was used to estimate odds ratios (OR) and their 95% confidence intervals (95% CI). All data analyses were conducted using SAs 9.4.
Results: In 2014, there were 456232, 471996 and 161696 WB donors contributed 739949, 662661 and 194351 WB collections in FS, MO and MMS, respectively. 47.9% of the first time donors were recruited from MMS. The average units of WB donation per donor was significantly higher in FS (2.38, 95% CI: 2.37 to 2.38) than that in MO (2.03, 95% CI: 2.03 to 2.03) and in MMS (1.51, 95% CI: 1.51 to 1.52), and this phenomenon is the same in all age groups in both genders. Highest percentage of the regular donors was observed in FS (72.9%) than in MO (64.8%) and MMS (43.8%), and regular donors are safer blood source than others with the lowest confirmed HBV, HCV or HIV positive rate (0.09 per 1000 vs. 1.72 per 1000 in returning donors, and 16.91 per 1000 in first time donors, P < 0.0001). In addition, the first return rate of the first time donors recruited at FS (50.0%) was significantly higher than that at MO (44.8%) and at MMS (46.1%), and the adjusted OR was 1.28 (95% CI: 1.25–1.32) at FS and 1.10 (95% CI: 1.06–1.13) at MO compared with that at MMS. Furthermore, among the first time donors who had their first return donation, the second return rate was significantly higher in donors whose first return donation was done at FS (OR = 1.4, 95% CI: 1.36–1.45) compared with those at MO or MMS. Summary/Conclusions: Blood centers should have different strategies for collecting blood suitable for local conditions. Mobile is still the main donation site to recruit new donors, especially for young donors from MMS. Blood collections from FS were observed with a main contribution to the demands of blood, the safety of blood, and the retention of blood donors; therefore, FS has advantage of long-term donor management.

P-087
THE INTENTION OF RETURN DONATION AMONG THE LAPPED YOUNG DONORS AFTER THEIR FIRST DONATION – SOUTHERN TAIWAN’S EXPERIENCE
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Background: In Taiwan, young donors play a major part among our first-time donors. In 2012, among all the 164368 first-time donors, the number of aged 17–24 young donors was 119863, which accounted for 72.8% of all first-time donors. However, only 30.7% of these young donors would keep donating blood next year, which means that nearly 70% of them didn’t become regular donors after their first-time donation. There is a need to identify factors explaining why some first-time young donors stop donating blood.

To address this phenomenon, in 2015, Taiwan Blood Services Foundation launched a campaign called “Young Blood”, aiming to encourage the continuous blood-donation of first-time young donors.

Aims: Discuss the connection among lapsed return intention of young first-time donors, attitude of blood-donation (ABD), experience of blood-donation (EBD), and knowledge about blood-donation (KBD); analyze if demographic attributes will impact the donors’ return intention; investigate the current situation of young donors’ continuous donation in Taiwan after “Young Blood” campaign.

Methods: A total of 13339 first-time donors, who donated in 2013 and were disappeared in 2014, were invited to participate the study. We mailed them a questionnaire assessing their intention of blood donation, ABD, EBD and KBD. Decision tree analysis and one way ANOVA test analyses were adopted to assess the effects of ABD, EBD and KBD on intention of blood-donation. The relationship between intention of blood-donation and donor demographics was explored.

Since the promotion of “Young Blood” campaign in 2015 by Taiwan Blood Services Foundation, we have designed brand new visual identities, adopted new activity themes, assigned endorsers, produced a series of brand-marketing-based micro films, and sent after-donation gifts suitable for young donors. We hope to find out
Background: Apheresis component collection is a rapidly growing area in the blood collection field. Single donor platelethepsis has numerous advantages over random donor platelets which include decreased risk of the transfusion-transmitted infections, bacterial contamination and all immunization. Because of these advantages, plateletpheresis supply is increasing year by year, which need for more plateletpheresis donors. In developing states like China, shortage also exists and the major plateletpheresis donors are voluntary donations and a few of family replacement donors. In China, the number of young blood donors increased by 1% (26,675 persons in 2016); blood donations increased by 0.3% (35,401 donations in 2016). Blood donors, etc. In addition, the painful experience resulting from sampling capillary blood may reduce the willingness of recruitment and retention of blood donors. Aims: The purpose of this study was to evaluate the accuracy of a non-invasive method for hemoglobin screening in blood donors, and to assess whether it has the potential to replace the currently used CuSO4 method in Taiwan. Methods: Pre-donation Hb levels of blood donors were simultaneously measured by Pronto-7 (Maximo, USA) and CuSO4 methods. The performance of these two methods was evaluated by comparison with the reference method, the KX-21N automated hematology analyzer (Sysmex, Japan). The cutoff Hb values of 12 g/dl for females, and 13 g/dl for males were used for minimum requirement of donor acceptance in Taiwan. If passed the CuSO4 test, the participant was eligible to donate blood, and an EDTA tube was filled with 2 ml blood sample from the diversion pouch of the blood bag, and subjected to Hb determination by the KX-21N analyzer. If failed the CuSO4 test, the participant was not eligible for blood donation, and blood was drawn by additional venipuncture for Hb determination. Results: A total of 603 blood donors were enrolled in the study. Coefficients of variation in duplicate measurements were 2.14 for Pronto-7 and 1.01 for KX-21N. The mean Hb values were 13.87 g/dl (95% CI, 13.76–13.98 g/dl) by Pronto-7, and 14.61 g/dl (95% CI, 14.49–14.73 g/dl) by KX-21N respectively. The Pronto-7 test underestimated Hb values without statistical significance (mean bias −0.75 g/dl; 95% limits of agreement, −3.08, 1.58) compared to KX-21N test. Regarding the false acceptance rate, no statistical significant difference (P > 0.05) was found between Pronto-7 and CuSO4 methods, in which 1.3% donors by Pronto-7 method and 1.5% donors by CuSO4 method were inappropriately accepted to donate blood, compared to the reference method. However, the false deferral rate of Pronto-7 method with 11.8% was much higher than that of CuSO4 method, with only 0.3%. A significantly higher deferral rate of Pronto-7 compared with CuSO4 was observed (P < 0.05). Summary/Conclusions: The replacement of CuSO4 method by non-invasive methods is promising and should be encouraged, since they have advantages of eliminating pain and reducing the fear and stress compared to invasive methods. In this study, the Pronto-7 showed a low false acceptance rate, but a relatively high deferral rate. Therefore, to raise the blood donor acceptance, a second method is necessary to retest those with Hb values below the cutoffs.
Aims: To determine the knowledge of TTI among the donors who were screening positive for HIV 1/2, HBV, HCV and Syphilis.

Methods: This is a descriptive cross sectional study during the period from 01st August 2016 to 31st January 2017. Total number of 171 donors who donated blood in to National Blood Centre and screening positive for HIV 1/2, HBV, HCV and Syphilis were participated.

Results: A total of 171 screening positive donations were recorded during the study period. 118 (69.9%) were males and 53 (30.1%) were females. 82 (47.9%) donors were belongs to 26–35 years age category. Among the study population, 130 (76%) were first time donors and 41 (24%) were repeat donors. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. But 110 (64.3%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results. 168 (92.8%) donors answered that diseases could be transmitted through blood transfusion. Out of this number, 140 (81.8%) donors mentioned only one example for blood born diseases and 51 (29.8%) mentioned none of diseases. 166 (97%) donors donated blood voluntarily and none of donors donated for checking results.

Summary/Conclusions: Majority of donors had general knowledge regarding blood born diseases and sexually transmitted diseases. But most of donors mentioned about HIV. They couldn’t mention other diseases which were tested in transfusion service. None of donors donated blood for checking their health status. The knowledge of blood born diseases and sexually transmitted diseases should be improved. This could be achieved by organizing the lectures, small discussions prior to or during blood donation campaigns. For general awareness, leaflet distribution and display of banners could be arranged. Conducting monthly blood collection campaign organizer meeting these massages could be easily convey to the blood donors. Publishing small articles, massages, and reminders in to the social media may be a successful alternative during awareness.

P-096

Abstract has been withdrawn

P-097

A PRELIMINARY STUDY ON THE EFFICIENCY OF APERESIS PLATELET DONORS RECRUITING BY TELEPHONE

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Background: With the increasing demand for apheresis platelet, it is the priority work to establish a sufficient and effective group of fixed component donors. To find out the effective strategies to improve the proportion of fixed donors, we contacted with the apheresis platelet blood donors who no longer come to donate in last 3 years by telephone.

Summary/Conclusions: The implementation of the strategy of the construction of regular apheresis donor to ensure the steady growth of the apheresis donation account for more than 90.0% of total blood.

Methods: The regular apheresis donor team construction initiatives included: (1) To focus on publicity and education, all staff to participate in recruitment (2) To optimize the process to rationalize and humanize the staff allocation, group collaboration, before- and-after collection security, equipment and material configuration arrangements. (3) To locate the position of medical staffs, reducing the shift and transactional interference, and to implement the whole-process management and the continuous overall care. (4) To pay attention to extended after-donation services, including routinely visit and greeting to the first-time apheresis donors and the establishment of a “platelet family” online group, by which we can timely communicate with blood donors. (5) To implement precise recruitment and retention. To provide personalized education, encouraging reserved donation; to promote health education and behavior intervention to failed blood donors so as to retain them; to carry out “1+1 Love Relay Activity “, recruiting new members. (6) To establish a blood donor incentive-care retention mechanism. Set up a dedicated website and the Hall of Fame, to provide social networking activities, donation gifts in birthday month, accident insurance and medical card for those donate more than 10 times per year; usually send messages of thanks, birthday and festival greetings. (7) To standardize the management of reservation, the effectiveness of recruitment and retention implement performance appraisal. To carry out innovation and research for recruitment and retention. To research health education path management of the first-time apheresis donors. To carry out the application research of the health promotion technology of the unqualified blood donors.

Results: By the end of 2016, the number of regular apheresis donor and the times of regular apheresis donation accounted for 67.5% and 89.4% of the total blood respectively. The blood donation of the regular apheresis donors accounted for 91.4% of the total blood volume, and the times of regular apheresis donation increased to 45.0% of the newly increased apheresis donors. The qualification rate of primary screening and donated blood test increased to 85.5% and 99.6% respectively. The proportion of times were 39.4%. In the face of the arduous task of the construction of the regular apheresis donors, we took various measures in 2013 to carry out the construction of the regular apheresis donors team.

Aims: To sustainably develop the regular and voluntary non-remunerated apheresis donor team to make regular apheresis donation account for more than 90.0% of total blood.

Methods: The regular apheresis donor team construction initiatives included: (1) To focus on publicity and education, all staff to participate in recruitment (2) To optimize the process to rationalize and humanize the staff allocation, group collaboration, before- and-after collection security, equipment and material configuration arrangements. (3) To locate the position of medical staffs, reducing the shift and transactional interference, and to implement the whole-process management and the continuous overall care. (4) To pay attention to extended after-donation services, including routinely visit and greeting to the first-time apheresis donors and the establishment of a “platelet family” online group, by which we can timely communicate with blood donors. (5) To implement precise recruitment and retention. To provide personalized education, encouraging reserved donation; to promote health education and behavior intervention to failed blood donors so as to retain them; to carry out “1+1 Love Relay Activity “, recruiting new members. (6) To establish a blood donor incentive-care retention mechanism. Set up a dedicated website and the Hall of Fame, to provide social networking activities, donation gifts in birthday month, accident insurance and medical card for those donate more than 10 times per year; usually send messages of thanks, birthday and festival greetings. (7) To standardize the management of reservation, the effectiveness of recruitment and retention implement performance appraisal. To carry out innovation and research for recruitment and retention. To research health education path management of the first-time apheresis donors. To carry out the application research of the health promotion technology of the unqualified blood donors.
Aims: To investigate the causes of the loss of apheresis platelet donors and evaluate the effect of telephone recruitment.

Methods: A total of 1,467 members of the blood donors were given telephone communication to summarize the reasons for the loss of their donations and to mobilize them to donate blood again. The results were analyzed statistically.

Results: The total loss rate of blood donors in Jiangsu Blood Center was 46.1% from 2014 to 2016, with an annual average loss rate of 29.7%. The reasons for the loss included telephone number changed, been not local, had no time and without intention. A total of 209 (14.2%) of the donors agreed to donate again, but the total number of successful donors was 87 (5.9%). The longer the loss, the lower rate of successful donation.

Summary/Conclusions: The recruitment strategies should be targeted for component blood donor, improve the satisfaction of blood donation, and to maintain the blood donors with moderate contact and communication. Blood donation service work should be improved to establish a stable and sustainable development of component blood donors team.

P-099 THE CHARACTERISTICS OF PLATELETPHERESIS DONORS IN GUANGZHOU, CHINA
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Background: Plateletpheresis (P-)donations have gradually become indispensable resources in modern blood transfusion practices worldwide. The P-donation system and the apheresis technology has been developed during the past two decades in China. However, the increasing supply has not kept pace with the rapidly increasing clinical demand for platelet. The P-supply relies on the sufficient P-donors recruitment.

Aims: The better understand of the Characteristics of P-donors may help to find out the motivation of P-donation. Base on different motivation, blood banks can tailor make different kinds of strategies to recruit P-donors in different characteristics.

Methods: This is a descriptive study on the demographic profile of P-donors in Guangzhou, China. The factors include demographic factors of donors and the characteristics of donation experience. The demographic factors include age, gender, education level, registered residence (whether resident population in Guangzhou or not) and occupation. The characteristics of donation experience refer to the numbers of past donation, recruitment methods and donor’s career stages (i.e. first time donor, repeated donor and lapsed donor). Logistic regression is used to identify whether the above independent factors (rates) are associated with different factors.

Results: In this sample, the proportion of male blood donors was 66.9%, which was much higher than that of women. Blood donors in 26–35 years accounted for 42.1%. Workers and students were the main part of donors. 57.8% were first-time donors, and 42.2% were repeated donors. 54.5% reported an education level of primary or secondary school. About 1.0% of whole blood donors were P-donors. The other factors such as level of knowledge, family monthly income, perception towards altruism, national duty and health effect were not statistically significant.

Summary/Conclusions: In conclusion, age, sex, perception towards harmful effect, and education level are closely related to P-donation. Base on different motivation, blood banks can tailor make different kinds of strategies for P-donation.

P-100 ASSOCIATED FACTORS FOR BLOOD DONOR AMONG THE UNDERGRADUATE STUDENT IN A PUBLIC UNIVERSITY
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Background: Statistics data provided by the Malaysia National Blood Centre have indicated that only 3% of the population donated blood in the past 5 years when the targeted value is 10%. Amongst of the reasons that people do not become blood donors are due to lack of knowledge and false belief about donation program. Blood donor pool should be sustained with young and loyal donors. Getting and recruit younger people to donate blood and to maintain donor pool is a challenging task. Study on the factors that influence the practice of blood donation among young people is needed to increase more participation from this group of youngsters.

Aims: The aim of this study is to assess the associated factors for potential young blood donors among undergraduate students in a public university.

Methods: This cross sectional study had involved 304 respondents. Participants were selected by convenient sampling technique. The respondents were given a set of questionnaires consists of knowledge and perception towards blood donation. Data were entered, cleaned and analyzed using Statistical Package for Social Science (SPSS) software version 22.0. Chi-square test was used to determine any significant association between blood donor group and the factors studied. A P-value of <0.05 was considered as statistically significant.

Results: A total of 304 respondents with a mean age of 19.28 ± 0.71 (18-25 years old) with ratio 1:5 male to female. As many of 18.4% (n = 56) of respondents was a regular/previously blood donor. There were five factors significantly associated with blood donors. The factors were sex (male 38.5% vs female 14.3%, P = 0.008), age group (<19 years old 12.9% vs 20 years old 26.2%, P = 0.03), perception do they know where is the location of blood bank (yes 30.8% vs no 15.1% vs I don’t know 6.4%, P < 0.001), perception that blood donation is a religious duty (yes 19% vs no 23.6% vs I don’t know 8.2%, P = 0.046) and also perception that blood donation is harmful (yes 6.7% vs no 22.8% vs I don’t know 4.3%, P = 0.003). The other factors such as level of knowledge, family monthly income, perception towards altruism, national duty and health effect were not statistically significant.

Summary/Conclusions: In conclusion, age, sex, perception towards harmful effect, a location of blood bank and religion play associated factors among undergraduate students in a public university.

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93.8% were deferred due temporary reasons and 6.2% were deferred permanently. Among total deferrals, 13.1% were due to low-hemoglobin-levels; 15.4% due to low-body-weight; 14.9% were deferred due to medications; 9% due to chronic major illnesses. 8.3% due to H/O blood donation <3 months; 7.8% due to H/O illnesses related to Hepatitis B or C, syphilis or malaria; 5.6% due to high BP; 3.4% due to hyperglycemia; 2-3% were deferred due to high risk behavior and 1-2% due to other reasons.

Summary/Conclusions: Early diagnosis and treatment along with follow-up facilities must be strengthened at Blood Bank level to maintain Safe-Donor-Pool for future blood availability by decreasing drop outs of the potential donors. Anemia and low body weight being the leading causes of donor deferral, public health measures must be carried out to correct them in general population.

P-102
BLOOD DONOR MOTIVATIONS, SATISFACTION AND LOYALTY: A STUDY IN KUNMING, YUNNAN PROVINCE OF CHINA
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Background: In modern healthcare, blood supply has become an important social problem. The blood donor system is only depends on voluntary donors in the Kunming, Yunnan Province of China. Voluntary blood donors may have different motivations for donating blood, and there are differences in satisfaction with blood donation. Donor recruitment and retention are crucial for sustaining blood safety and sufficiency.

Aims: Aims are to explore the motivations, satisfaction and loyalty of Kunming blood donors, update donor recruitment and retention.

Methods: The study was conducted at the blood collection sites of Yunnan Kunming Blood Center. Active donors randomly (N = 1031) between May and August 2016 filled in a validated questionnaire during donation. SPSS software was used to statistically analyze the responses. Univariate analysis was done using Fisher’s exact test. A multiple variate model was constructed controlling for gender, age, occupation and education background, including the variables that were significant in univariate analysis.

Results: Factor analysis of 7 genre blood donation motivations revealed three factor named “social responsibility and devotion of love”, “reserve blood and self-benefit”, “convenient and easy” reached statistical significance. The results with regression analyses showed that only “social responsibility and devotion of love” had an significant effect independent of gender, age, occupation, and education on blood donation. The overall satisfaction of blood donation was 99.89% among both women and men. The satisfaction to waiting time before donation was the lowest (90.11%), and to service attitude of staff at blood collection sites was the highest (91.54%).

Summary/Conclusions: It showed that blood donation motivation not only linked to a high degree of altruistic reasons, but also to a combination of some self-regarding motives. By analyzing the motivation and satisfaction of blood donation, we can improve the service process and promote the recruitment and retention of blood donation.

P-103
ANALYSIS ON INFORMING ON BELOW STANDARD BLOOD TESTS RESULTS AND IMPROVEMENT MEASURES
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Background: Based on People’s Republic of China Blood Donation Law · Blood Center Administration Measures, Blood Center Quality Management Rules, blood donors are required to do the compulsory free health checks before donating blood, and should agree to follow the principles of voluntary donation, and informed and consent. All the services are provided by the blood center. Meanwhile, we are required to give feedback to the donors based on the results of the blood tests. According to the test results, we divided those into “qualified blood” and “unqualified blood”. But if our staff does not properly inform the unqualified result, it is easy to cause medical disputes, and even legal proceedings. Therefore, all the blood stations pay much attention to the great importance of this work, and all staff are suggested to contact donors by telephone, SMS, mailing or letters, interviews in time. All the unqualified results should be informed personally and confidentiality.

Recently, we have put lots of efforts on combining various specific practice and performed several analysis in order to improve the skills and methods of informing, enhance the satisfaction of donors, provide better services for blood donors, and to promote the healthy and sustainable development of voluntary blood donation in this region.

Aims: To improve the method of informing blood donors of disqualified blood detection results, as well as to promote healthy and sustainable development of regional blood donation.

Methods: Modern management information systems, such as SHINOW9.0, of ALT, HBsAg, anti -HCV, anti - HIV, anti -TP, were used to give responses to the donors regarding their ‘below standard’ blood test results within 1 month of the blood extraction. The following conditions were regarded as failure to inform: when people gave an empty or wrong number, a number that does not correspond with the donor, and when people did not leave contact information. In addition, another condition that if the donor could not be contacted over three different times during a day.

Results: Between the 1st of February, 2015 and the 31st of January, 2016, the number of ‘below standard’ blood test results amounted to 3,695 people, of which 3,302 people were informed successfully and the inform success rate was 89.36%. On the other hand, 393 people had failed results, and the inform failure rate was 10.64%. All the failures were due to cancelled, switched off or non-answered phones, wrong numbers and not leaving contact information.

Summary/Conclusions: In order to ensure we have the accurate and complete information about our blood donors, we need to control the information collection from the starting point. Secondly, the construction of laboratories should be enhanced and external interference should be eliminated. Thirdly, we need to improve our communication methods and skills by giving information. We should also enhance satisfaction in blood donors, and reduce the occurrence rate of medical disputes.

P-104
A PRECISE RECRUITMENT STRATEGY FOR REPEATED BLOOD DONATION ANALYSIS IN ZHEJIANG BASED ON REPEATED BLOOD DONORS
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Blood center of Zhejiang Province, Hangzhou, Zhejiang, China

Background: Unpaid blood donation is a common problem, in the past few years, many developed and developing countries scholars have carried out the attitude and motivation of blood donors to study. Some scholars believe that the possibility of repeated blood donation and the first and second blood donation interval. For the analysis of the timing of recruiting blood donors, there are few reports in the literature.

Aims: To understand the frequency of blood donation and the behavior of donation in Zhejiang province from 2006 to 2015, and to find out the best intervention time and recruiting people to develop accurate recruitment strategies.

Methods: The relationship between blood donation behavior, blood donation frequency, recurrence time and demographic characteristics was statistically analyzed by descriptive statistics and Cox regression.

Results: Among the total blood donors, 69.23% were the first donors, and 2 were donated twice. Blood donation for the first time and the second interval, the third and second interval or the fourth and third interval, again blood donation time in half a year to 1 year high, accounting for 40.79%, 47.55% and 53.07%. Sex is unstable in the probability of repeated donation of blood donors again. In the second and the first repeated blood donation, for example, in the blood donation age, relative to the age of 18–25 years of age, 26–35 years old, 36–45 years old, 46–55 years old, 56 years of age repeated blood donation the probability of blood donation is 1.198, 1.515, 1.468 and 1.003 times respectively; in the educational level, junior high school, high school, university, graduate students and others are primary school education degree of repeat blood donors once again the probability of blood donation 1.074, 1.121, 1.201, 0.937, 0.963 times; in the occupational type, staff, workers, farmers, medical workers, national staff, soldiers and other students were repeated blood donors again the probability of blood donation 1.502, 1.574, 1.852, 2.152, 2.072, 1.359, 1.384 times.

Summary/Conclusions: It is necessary to carry out repeated blood donation research to improve the frequency of donation again. It should be classified for different blood donors. It is necessary to pay attention to the demographic effect of repeated blood donors and take intervention measures to improve the repeated blood donation rate.
P-105
APPLICATION OF SOCIAL MARKETING/PLANNED BEHAVIOR TO CONVERT AND RETAIN REPLACEMENT DONORS INTO VOLUNTARY DONOR
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Background: In Pakistan the blood donation and transfusion services are still exceptionally promising comparing with worldwide practices. Voluntary Blood Donors are the indispensable source of safe blood. Presently the attitude of voluntary blood donation in Pakistan is extremely disappointing. It is reported the only 10% of people donate blood voluntarily while 90% are family or replacement donors. According to WHO all countries should aim their transfusion services based on voluntary non remunerated blood donation so that by 2020. In order to achieve this goal, social marketing concept may positively promote voluntary blood donation rate. Social marketing is a new idea and considered as a successful tool to promote public health programs through planned behavior theory. In present study, we have adopted various factors for changing concept of replacement donation into voluntary blood donation.

Aims: The aim of our study was to promote voluntary donation rate in Pakistan by implementing of social marketing concept.

Methods: This study would be conducted at Blood Bank of Rawalpindi Institute of Cardiology, Pakistan. Theory of planned behavior and different social marketing strategies (create awareness and interest, information about need of blood, positive attitude of blood bank staff, motivation, extra attention to donors and decreasing risk of fear) applied on the target population of replacement donors. The data and response from 250 participants were collected through designed questionnaire and analyzed by SPSS 16.0.

Results: In our studied population the minimum age limit was 18 years whereas maximum age was 49 years with the mean value of 29 ± 10.7. By implementing theory of planned behavior; out of 250 responded participants, 93.0 individuals (37.2%) showed a changing tendency of voluntary donation (they were registered as voluntary donors).

Summary/Conclusions: The present study provides some useful information regarding boosting of voluntary blood donation rate in Pakistan. Voluntary donation can be improved by changing the behavior of blood bank staff, giving extra care to donors and by appointing a social marketer who are trained to sensitize, educate, and bring awareness about voluntary blood donation in family/replacement blood donors.

P-106
PREVALENCE OF ABO AND RHESUS BLOOD GROUPS AMONG BLOOD DONORS IN NATIONAL BLOOD BANK SERVICE, ADDIS ABABA, ETHIOPIA
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Background: ABO and Rh blood groups are the most studied blood group systems among mammalians due to their clinical, genetic and anthropological importance. Together these two systems have proved to be the most important, for blood transfusion purposes. The knowledge of distribution of ABO and Rhesus (Rh) blood groups at local and regional levels is helpful in the effective management of blood banks and safe blood transfusion services for donor recruitment and also stock management.

Aims: To assess the ABO and RH blood group distribution among blood donors who donated blood in national blood bank service, Addis Ababa.

Methods: Facility based cross-sectional retrospective record review was conducted at National Blood Bank Service. A structured questionnaire used to collect data from July 1/2015 to June 30/2016 and a total of 48,212 voluntary non-remunerated blood donors data were reviewed. Data was entered and analyzed using SPSS version 20. Descriptive statistics, including frequencies and percentage were used to present data in text and tables.

Results: The predominant blood donors belonged to age groups between 18-24 years (52.5%). Male donors were more than female donors, ratio approximately 2:1. Majority of the blood donors were private workers (65.1%) followed by students (30.7%). The others are civil servants (4%) and unemployed (0.1%). The most common blood type is group O (41.7%) and least common being AB (6.4%). The other groups account A (29.2%) and B (22.7%). The prevalence of Rhesus positive an negative distribution in the studied blood donors was 92.5% and 7.5%, respectively. Blood groups frequency with respect to ABO and Rhesus status was found to be shown by formula O/A/B/AB.

Summary/Conclusions: Knowledge of frequency of the different blood groups is very important for blood banks and blood transfusion services that would contribute significantly to the national health system. The finding from this study will also serve as an input for National Blood Bank Service to recruit and mobilize blood donors based on age and also occupation if there is a blood shortage in general and also if there is a specific blood group shortage in particular.

P-107
APPLICATION OF ANISODAMINE IN THE TREATMENT OF SEVERE BLOOD DONATION REACTIONS
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Background: The severe blood donation response seriously affects the health of blood donors. How to use drugs to quickly restore blood donors to normal is a new research topic. Aims: To investigate the effect of anisodamine in the treatment of severe adverse reaction in effect, provide the basis for treatment. Methods: A total of 30 cases of severe blood donation from 2012 to 2016 were collected and grouped, control group and experimental group with 15 cases in each group, the former using conventional processing methods, which in addition to conventional treatment, intramuscular injection of anisodamine to 10 mg. Two groups were observed and recorded from blood donation reaction to restore their own after the departure time, and on the second day follow-up results were compared.

Results: The control group in 13 cases of recovery time ranging from 0.5-4 h, 2 cases still do not recover for more than 4 h and need further treatment in the hospital. 11 cases in the experimental group within 0.5 h of recovery, 4 cases recovered within 0.5-1 h; visit almost all in control group, fatigue in second days, dizziness and other symptoms, 2 cases still need to stay in bed, while the experimental group only individual fatigue, dizziness, and No other discomfort.

Summary/Conclusions: Anisodamine can effectively relieve the symptoms of severe adverse reaction and shorten the reaction time, it is worthy of popularization and application.

P-108
ANALYSIS OF ATTITUDES OF REGULAR BLOOD DONORS REGARDING BLOOD DONATION AND DONOR RETENTION WHO DONATED BLOOD INTO THE NATIONAL BLOOD CENTER, SRI LANKA
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National Blood Center, Colombo, Sri Lanka

Background: Sri Lanka has centrally coordinated blood transfusion service and donations totally depend on voluntary non remunerated blood donors. Regular blood donors are the backbone of transfusion service. While maintaining continuous blood supply, the service meets challenges in recruiting and retention of blood donors. These challenges make the exploration of factors affecting blood donation in order to identify effective strategies for increasing the donor base and fulfilling future blood need.

Aims: To analysis of attitudes regarding blood donation and donor retention strategies among regular blood donors in Sri Lanka.

Methods: A prospective community based study was carried out. Total numbers of 3629 donors were participated. All donors who donated blood twice or more (n = 3981) in to the National Blood centre within 1st January 2015 to 31st March 2015 were eligible for this study. Out of 3981 regular donors, 151 were refused to participate and 201 were not responded. Results: Among the total study group 2579 (71.1%) were males and 1050 (28.9%) were females. 1332 (36.7%) donors believed that others will identify himself as a important person when he/she be a blood donor. But 1351 (37.2%) donors were against it and 946 (26.1%) had no answer. 2919 (80.4%) donors thought that blood donation is a responsibility and 328 (9%) donors challenged it.

As a habit, 2086 (57.5%) donors would like to donate blood. 912 (25.1%) donors were disagree the concept and 631 (17.4%) donors were not answer. 3059 (84.3%) donors would like to donate for helping other people but 236 (6.5%) were against it.
Results: The total number of temporarily deferral at NBC between year 2010 and 2014 is 147,087 donors out of 803,431 which represents about 18.3% of total temporary deferral. Donors who return were significantly younger than donor who did not return (29.5 years versus 35 years, P < 0.05) and had higher proportion (61.3%) for females. Females had higher proportion (61.3%) for return compared to males (38.8%). Singles (68.3%) were more likely to return for donation compared to married donors (31.7%). Relating to occupation; comparing return versus did not return donors professionals (38.8% versus 33.3%), student (26.4% versus 20.4%), general worker (21.9% versus 21.7%), uniform body (6.4% versus 9.6%) and housewife/unemployed (6.3% versus 15%). Donors who lived in urban areas were more likely to return for donation compared to donors who lived in rural areas (34.6%).

Summary/Conclusions: This study, clearly showed that younger generation, single and professionals from urban areas contributed to higher rate of return donor. Thus focusing on this category of donors to become regular donors will enable us to enhance and improve transfusion service in Malaysia.

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EFFECT OF AIDET COMMUNICATION MODE ON THE BLOOD DONORS

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Background: AIDET is an acronym for ‘Acknowledgement, Introduce, Duration, Explanation, Thank you’ and AIDET communication mode is widely and effectively used in field of patient care. Building the standardization of communication procedure and language through AIDET communication mode is to improve the effect of blood donors history questionnaire.

Aims: To investigate the effect of AIDET (Acknowledgement, Introduce, Duration, Explanation, Thank you) communication mode on the blood donors history questionnaire.

Methods: The AIDET communication procedures and template were established since 2016 in our blood center, the donor satisfaction and the retention of donors were valued after the application of the AIDET communication mode.

Results: Blood donors scores about communication values improved significantly and more donors were willing to donate again through the implementation of the communication mode.

Summary/Conclusions: AIDET communication mode can effectively improve the effect of blood donors history questionnaire.

ANALYSIS REPORT OF APHERESIS PLATELET AND WHOLE BLOOD DONORS IN 2014–2016, DALIAN

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Background: In recent years, with the rapid increase of blood volume in clinical application, the difficulties and pressure of blood donation became stronger that the recruitment of blood donation was particularly important.

Aims: Therefore, we made a detailed investigation and analysis the donors’ on two kinds of blood donation form, in order to finding the different forms of recruitment methods, and striving to expand whole blood and platelet donation volunteers.

Methods: We try to analysis on the occupation, educational background, age and gender of voluntary donors in 2014–2016 by statistical methods.

Results: 1. people engaged in other work was mainly donors that the team of the platelet, and the workers, farmers, students, employees of enterprises and institutions were assistants. The whole blood donor team was mainly people engaged in other work and students, workers, farmers, employees of enterprises and institutions were auxiliary. As the proportion of group blood donors increased, the proportion of workers, farmers and students in whole blood donors showed an upward trend, and caused the loss of some apheresis platelet donors. 2. College degree or above accounting for about 30% of the apheresis platelet donors, while for about 50% of the whole blood donors; The special secondary school education and below were nearly 70% of the apheresis platelet donors, while for about 50% of the whole blood donors; 3. In terms of gender, male donors accounted for nearly 70% of the apheresis platelet donors, while for about 50% of the whole blood donors; 4. In terms of education, male donors accounted for nearly 70% of the apheresis platelet donors, while for about 60% of the whole blood donors, in recent years, male donors in both whole blood and apheresis platelet had shown a downward trend, while on the contrary, female donors showed an upward trend. Between the ages of 25–30 and 30–35, both male and female donors had shown a downward trend in whole blood and apheresis platelet. The age group of 35–55 and above, both male and female donors showed an upward trend, in the apheresis platelet donors, the upward trend was more obvious.

Summary/Conclusions: There were differences in the composition of whole blood and apheresis platelet donors, and we should take different recruitment according to the characteristics of their respective groups.

STUDY ON THE EFFECT OF COLD STIMULATION INTERVENTION ON REDUCING BLOOD DONATION

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Background: At present, 100% of the blood used in our country comes from the voluntary blood donors. It is necessary to expand the blood donors, protect the physical and mental health of blood donors, avoid blood discarding, and fully meet the clinical use of blood, which is the focus of blood bank work. Blood donation reaction is one of the reasons of blood donors fear, is one of the main reasons for inadequate blood collection, blood will not only cause the scrap, will let the fear of blood donors, blood loss caused by the source, and the cause of blood donation to the healthy development of the negative impact. It is an urgent problem for the blood bank to take reasonable measures to reduce the incidence of blood donation and to avoid the loss of blood donors.

Aims: To explore the role of cold stimulation intervention in reducing blood donation reaction.

Methods: October 2003 – October 2013, Handan blood center were found in 2352 cases of blood donors, blood donation reaction delayed or first blood donation reaction occurs in the blood before blood donation reaction, including selection of blood donation reaction history, delayed blood reaction history or for the first time in the blood before blood donation but 200 cases of blood donation reaction of blood donors on the basis of the blood donation reaction type, according to the odd and even number randomly, 3 patients in each group had a history of blood donation reaction including blood donors in 90 cases, delayed reaction to blood donation his- tory of blood donors, but the first blood donation in the blood before the appearance of 7 cases of blood donation reaction. The intervention group was divided into the intervention group and the control group according to the cold stimulation intervention, 100 cases in each group. The control group received voluntary blood donors with routine treatment (normal temperature + psychological counseling), and the intervention group (cold stimulation intervention + psychological counseling). Comparing the intervention group and the control group, the blood donation reaction of the voluntary blood donors decreased or disappeared.

Results: The decrease or disappearance rate of blood donation of the intervention group was significantly higher than that of the control group (P < 0.05). The intervention group in blood donors was decreased or disappeared was higher than that in spring and autumn (P < 0.05), was significantly higher than that in winter (P < 0.01), which may be related to the summer hot weather, many people of untoward reactions occurred in winter, people less about blood donation reaction occurred, and season, temperature was positively related to blood donation reaction, also demonstrated the occurrence of cold stimulation can effectively reduce blood donation reaction.
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RELATIONSHIP BETWEEN DONATION FREQUENCY AND IRON STATUS IN DONORS AT PMI YOGYAKARTA
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Background: In 2013, only about 50% of blood supply fulfilled the total need of blood. The high demands for blood enhance the need for donors to repeat donation. Blood donation has a profound impact on body iron stores and is an important factor for iron deficiency in blood donors. In blood donation, 200–250 mg iron are lost from each collection procedure of 425–475 ml blood. Higher donation frequency can result in iron deficiency and anemia. Assessment of hemoglobin level can prevent donation by individuals with anemia, but it is not a good predictor for iron status of donors.

Aims: To determine the relationship between donation frequency and iron status in donors at PMI Yogyakarta.

Methods: This was a cross sectional study conducted for 3 months, from September to November 2014. The study involved 120 donors from blood donation center PMI (Indonesian Red Cross) Yogyakarta. Sample was selected based on the selection criteria and collected consecutively.

Results: A total of 98 subjects that met the criteria were studied, consisted of 74 male donors and 24 female donors. From 98 subjects, 49 subjects (50%) had 1 donation in the previous year, 21 subjects (21.4%) had 2 donation, 21 subjects (21.4%) had 3 donation and 7 subjects (7.1%) had 4 donation. The blood donation frequency per year significantly related to serum ferritin level (P = 0.005; r = 0.280) and transferrin saturation (P = 0.034; r = 0.214).

Summary/Conclusions: There is a relationship between donation frequency and iron status (serum ferritin and transferrin saturation) in donors at PMI Yogyakarta.

P-117

RESEARCH ON BLOOD DONORS DISTRIBUTION AND ITS CHANGING TRENDS IN DALIAN
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Background: In Dalian recruitment and retention of sufficient numbers of blood donors continues to be a challenge. Understanding who donates blood will help blood centres to target more effective recruitment and retention strategies.

Aims: This study aims to analyze the gender, age and source (organizations or individuals) of distribution about blood donors in Dalian and varied trend from 2011 to 2015, evolve and improve reference basis for donor recruitment measures.

Methods: Changes in gender, age and source (organizations or individuals) distribution among donors were analyzed through comparison of the volunteer donor population in different age and education levels, to establish reasonable blood donor recruitment measures and ensure enough blood supply.

Results: The donation proportion of voluntary blood donors from different population shows as gender, age and source (organizations or individuals), has its own characteristics. The distribution of voluntary blood donors in Dalian, such as gender, age and source (organizations or individuals), evolves and improves the reference basis for donor recruitment measures and ensure enough blood supply.

Summary/Conclusions: Cold stimulation intervention can significantly reduce the incidence of blood donation reaction and reduce the severity of blood donation reaction. This method is simple, safe, easy to implement and easy to be accepted by blood donors.

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Abstract has been withdrawn

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MEDICAL DEFERRALS DUE TO ANAEMIA AMONG BLOOD DONORS
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Background: Screening for anaemia is important for blood donation to protect and maintain the health of donors and improve the aim of red blood cell transfusion in the recipient. Haemoglobin levels should be above 110 g/l and 120 g/l in women and men respectively. One of the main reasons for the medical clinical deferrals of prospective blood donors is anaemia.

Aims: The aim of this study is to identify the prevalence of anaemia among prospective blood donors.

Methods: Prospective records of all the reported donors were collected from January 2015 to June 2017 at the Scientific-Production Center of Transfusionology, Astana. Haemoglobin estimation was performed by the rapid diagnostic method on haemoglobinometer Hemo Cue HV201+ (Sweden), using capillary blood samples.

Results: Overall 130877 potential blood donors reported to the blood centre. Prevalence of anaemia in prospective blood donors was 3.5%. It was significantly higher in female donors compared with male donors (86% vs 14%). The level of anaemia was mild in 46% of the female donors while 35% had a moderate level and 4.3% had severe anaemia. Mild anaemia was seen in 10% of the male donors, followed by severe and moderate anaemias 2.1% and 1.9% respectively.

Summary/Conclusions: In conclusion, deferred anaemic donors should be informed about the prophylactic intake of iron supplements and referred for further follow-up so that they can be appropriately treated. In addition, it is important to determine the serum ferritin in regular blood donors.

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Abstract has been withdrawn

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Abstract has been withdrawn

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DISTRIBUTION CHARACTERISTICS AND COUNTERMEASURES FOR UNQUALIFIED FEMALE VOLUNTARY BLOOD DONORS WITH HEMOGLOBIN LUOYANG IN 2015–2016
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Background: The main reason of female donors whose Hb were unqualified were affected by age, occupation and education, the inappropriate cognition and behavior in the way of life. More blood physiological knowledge should broadcast in recruiting, through appropriate intervention and quickly corrected, more female donors could return to blood donation team.

Aims: Analyzing the female voluntary blood donors basic characteristics whose hemoglobin (Hb) were unqualified in Luoyang, to carry out the targeted health
education and broadcast the knowledge of voluntary blood donation, to prevent the loss of voluntary blood donors and improve the proportion of female voluntary blood donors. 

Methods: Statistical analysis was used in female voluntary blood donors' age, occupation, education level, hB and the times of voluntary blood donation in the past whose hB were unqualified before donation from 1st of January 2016 to 31st of December 2016 (both days included). And whether there is any significant number of Rh D negative donors becoming regular donors compared to Rh D positive donors handled by the DGH Hambantota blood bank from 1st of January 2016 to 31st of December 2016 (both days included). To find out the percentages of regular Rh D negative donors and find out whether there is any significant number of Rh D negative donors becoming regular donors compared to Rh D positive donors handled by the DGH Hambantota blood bank from 1st of January 2016 to 31st of December 2016 (both days included). And to find out the composition of the donor population for the above period, based on different blood groups. To find out what percentage of in house donors become regular donors compared to mobile donors.

Methods: Retrospective descriptive study on donor population received by DGH Hambantota over 1 year period to find out whether there is a higher tendency for Rh Negative Donors to become regular donors, from the records available at the blood bank at DGH Hambantota. In house and mobile donations were analysed separately. Results: The total number of donors during the study period were 2155, out of which 1950 (90%) were mobile donors and 205 (10%) were in house donors. 1468 (75%) of mobile donors were regular donors whereas 482 (25%) were first time donors. There were 1394 (99%) Rh D positive donors among the regular mobile donors and 74 (5%) were Rh D negatives. 456 (45%) first time mobile donors were Rh D positive while 26 (6%) were Rh D negatives. There was no statistical significance between the two groups.

Among in house donors, 183 (89%) were regular donors and 22 (11%) were first timers. 164 (89%) of regular in house donors were Rh D positive while 19 (11%) were Rh D negatives. 21 (95%) of first time in house donors were Rh D positives and 1 (5%) was Rh D negative. Again there was no statistically significant difference. There was more chance of an in house donor to be a regular donor compared to a mobile donor which was extremely statistically significant (P = 0.0001). This was true for both Rh D positive group (P = 0.0001) and Rh D negative group (P = 0.04).

There were 969 (45%) O positives, 48 (2%) O negatives, 526 (24%) B positives, 44 (2%) B negatives, 453 (21%) A positives, 19 (0.8%) A negatives, 87 (4%) AB positives, and 9 (0.4%) AB negatives. The number of B negative donors compared to B positive donors were statistically significant (P = 0.0106).

Summary/Conclusions: The in house donors are regular donors compared to mobile donors. However there is no increased chance of much rare Rh D negative donors to become regular donors either in house or at mobiles. This may be due to a lack of proper feedback and reminding mechanism to retain negative blood group donors within the donor pool. The increase occurrence of Group B Rh D negative donors in the donor population may be a local variation and will require more in depth study.

P.1-123 IMPACT AND ANALYSIS OF A NOVEL “FALL IN LOVE” RECRUIT METHOD ON SUCCESS RATE OF VOLUNTARY BLOOD DONATION VERSUS CONVENTIONAL RECRUIT METHOD E Dong Hunan Blood Center, Changsha, China

Background: Recruitment of first-time donors among the pedestrians is essential to maintain and enlarge a stable blood supply in China. Our center has set up 11 sites in Changsha city to recruit the pedestrians to join the voluntary, non-remunerated blood donation in recent years.

Aims: This study aims to assess the impact of a novel “fall in love” street recruit method on voluntary blood donation success rate versus the conventional recruit method and analyze the possible reasons.

Methods: The recruit team was divided into two groups. One group used a novel “fall in love” street recruit method, while the other group used the conventional method to recruit the donors. After 6 months, we compared the success rates between these two groups and analyzed the possible reasons.

Results: In 6 months, the novel method group successfully recruited 20,336 blood donors among 37,931 pedestrians with the success rate of 53.6%, while the conventional method group successfully recruited 18,283 blood donors among 39,497 pedestrians with the success rate of 46.3%. The success rates between these two groups showed statistical significance.

Summary/Conclusions: The novel “fall in love” street recruit method can greatly increase the success recruit rate of pedestrians to join the voluntary, non-remunerated blood donation. The reason for the higher success recruit rate may be the integrated use of psychology, language and behavior to motivate the pedestrians.

P.1-124 COMPARISON OF TENDENCY OF BECOMING A REGULAR DONOR BASED ON ABO AND RH D BLOOD GROUP AND PLACE OF DONATION AMONG DONOR POPULATION AT DISTRICT GENERAL HOSPITAL HAMBANTOTA SRI LANKA FOR YEAR 2016 S Kelumbi, M Adikarama and R Niyas Blood Bank, District General Hospital Hambantota, Hambantota, Sri Lanka

Background: Hambantota district is a coastline district in the south-eastern part of Sri Lanka, with a total population of 662,419. District General Hospital (DGH) Hambantota is the main medical institute of this district, serving the highest number of patients in the area.

Rh D Negative blood groups are rare. Only around 6–7% of world population has Rh Negative blood. This again differs among countries and ethnicities. While among Europeans these numbers are as high as 20%, the Asian countries have counts <3%. In far eastern countries like China and Japan, these numbers fall as low as below 1%. With this reduced numbers, the task of finding Rh D negative blood in Asian countries is even more challenging.

Aims: To find out the percentages of regular Rh D negative donors and find out whether there is any significant number of Rh D negative donors becoming regular donors compared to Rh D positive donors handled by the DGH Hambantota blood bank from 1st of January 2016 to 31st of December 2016 (both days included). And to find out the composition of the donor population for the above period, based on different blood groups. To find out what percentage of in house donors become regular donors compared to mobile donors.

Methods: The recruit team was divided into two groups. One group used a novel “fall in love” street recruit method, while the other group used the conventional method to recruit the donors. After 6 months, we compared the success rates between these two groups and analyzed the possible reasons.

Results: In 6 months, the novel method group successfully recruited 20,336 blood donors among 37,931 pedestrians with the success rate of 53.6%, while the conventional method group successfully recruited 18,283 blood donors among 39,497 pedestrians with the success rate of 46.3%. The success rates between these two groups showed statistical significance.

Summary/Conclusions: The novel “fall in love” street recruit method can greatly increase the success recruit rate of pedestrians to join the voluntary, non-remunerated blood donation. The reason for the higher success recruit rate may be the integrated use of psychology, language and behavior to motivate the pedestrians.

P.1-125 BLOOD SECURITY STRATEGIES FOR INTERNATIONAL CONFERENCE BASED ON THE INVESTIGATION INTO THE TREND OF UNPAID BLOOD DONATORS IN HANGZHOU, CHINA FROM 2011 TO 2015 L Pan, J Xu and W Hu Blood Center of Zhejiang Province, Hangzhou, Zhejiang, China

Background: The infusion of blood and corresponding products saves millions of lives every year, including conflicts, natural disasters and other emergencies. They can help the patients inflicted with diseases that threaten their lives live longer, improve the quality of life, and support some complex medical and surgical operations.

Aims: To conduct a statistical analysis of the structure of unpaid blood donors in Hangzhou, China from 2011 to 2015, and provide a solid scientific basis for the blood security on international conference and healthy development of unpaid blood donation.

Methods: Collect the data of unpaid blood donors in Hangzhou from 2011 to 2015, analyze the percentage of unpaid blood donors of different ages, genders, careers and academic degree to the total number of donators at the same period by means of GraphPad Prism, and carry out a short-term investigation into the situation of blood donation among the people nearby unpaid blood donation vehicle.

Results: The number of male donators is obviously larger than that of female ones. The young people of 18–34 years old, people of junior college degree and higher and those with uncertain careers constitute the main part of unpaid blood donors. From the investigation into the people surrounding the blood donation vehicle, it is found that 74.2% interviewees support unpaid blood donation. Based on the analysis of the trend of unpaid blood donors as well as the survey, the blood security strategies are thus formulated and the task of blood collection and security during the summit is completed.
Aims: The aim of this study is to investigate the correlation between red cell indices and ferritin serum in blood donors at PMI (Indonesian Red Cross) Yogyakarta.

Methods: The study used a cross sectional design. At correlation test, subject were divided based on gender, age, and number of donation in past 1 year. Correlation between red cell indices (MCV, MCH, MCHC) and ferritin serum was tested with Pearson correlation test.

Results: The Pearson correlation test showed significant correlation between red cell index (MCV) and ferritin serum in male donor who donate three times in past 1 year ($r = 0.581; P = 0.015$). Summary/Conclusions: There was significant positive correlation between red cell index (MCV) and ferritin serum in a group of male donor who donate three times in past 1 year.

P-130

ANALYSIS THE INFLUENCE FACTORS OF VOLUNTARY BLOOD DONORS’ RE-DONATION IN LUOYANG

K Xiao

Quality Control, Luoyang Blood Center, Luoyang, China

Background: Using the questionnaire of ‘Related behavioral factors of voluntary blood donors’ to analyze the influence factors of voluntary blood donors’ re-donation in Luoyang.

Aims: Investigation and analysis the influence factors of voluntary blood donors’ re-donation in Luoyang, it would provide the broad thinking in recruiting and attracting more people to participate involuntary blood donation and strengthen the blood donation teams.

Methods: The questionnaire of ‘Related behavioral factors of voluntary blood donors’ were conducted and collected in Luoyang, using two Logistic regression to analyze the influence factors of voluntary blood donors’ re-donation.

Results: 1) In 1472 questionnaires, including 867 males, accounted for 58.91% there were 477 donors in 25–34 years old, accounted for 32.40%; 408 donors in 35–44 years old, accounted for 27.72%; 629 donors’ were college/undergraduate, accounted for 42.73%; 432 donors were middle school and below, accounted for 29.35%; In the occupation, there were 448 farmers, accounted for 30.43%; 378 workers, accounted for 25.68%; 1003 people would repeat donation, accounted for 68.13%. 2) The influence factors of voluntary donors’ re-donation in Luoyang were the age, educational background, knowledge of voluntary blood donation, satisfaction of the voluntary blood donation environment and the service attitude.

Summary/Conclusions: Retaining 25–34 and 35–44 age groups and keeping 55–60 age groups blood donors, mobilizing all positive factors of donors with college/undergraduate or middle school and below, deepening and expanding publicity, providing good environment for blood donation and improving the quality of service, all of those would have the positive significance in retaining more donors become the fixed blood donors.

P-131

THE RESEARCH AND APPLICATION OF DATA ANALYSIS OF VOLUNTARY BLOOD DONATION RECRUITMENT IN BIG DATA ERA

F Jing

Quality Control, Tianjin Blood Centre, Tianjin, China

Background: With the popularization day and day that the computer employed, the management information system (MIS) of increasing constantly has been set up in the departments of enterprises and institutions progressively, the MIS has already become the indispensable important component in modern management activity as the important sign of the modernization of management of information. In order to meet the requirement of National Health and Family Planning Commission of the People’s Republic of China, must change recruiting the mode and work pattern of already existing non-remunerated blood donation. According to the recruitment of blood donors, the MIS has already conducted the blood management system further development, combined with the analysis of the age of big data, the use of micro media platform, try to promote the recruitment of blood donation.

Aims: To analyse the possible application of data in the recruitment of voluntary blood donation in big data era.

Methods: Back review the significance, model and application of the data analysis in the era of big data. To design and develop the blood donation APP, combined with the application of micro media platform, try to carry out the trials.

Results: Research and development of voluntary blood donation APP, through the wechat public number to send links propaganda, comprehensive consideration of the
application of APP. Design statistical cluster variable analysis scale was used to evaluate knowledge-attitude-practice (KAP) questionnaire and lifestyle variables of voluntary blood donation. Determine the amount of blood collection, blood sampling, blood distribution and other factors in the next 6-12 months. To statistics differences data between 2 years before and after the application of APP, and constantly improve and perfect the application of APP.

Summary/Conclusions: Through the application of micro media platform of the free blood donation APP, is conducive to supply the side structural reform, improve the supply of blood quality.

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Abstract has been withdrawn

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TURN AROUND TIME OF BLOOD DONATION IN BLOOD TRANSFUSION CENTRE, FACULTY OF MEDICINE, KHON KAEN UNIVERSITY, THAILAND

P Khampeera, P Sripara and K Phumikhom

Blood Transfusion Centre, Blood Transfusion Centre, Faculty of Medicine, Khon Kaen University, Thailand

Background: Non-remunerated Blood Donors need to be given the best care. Because there are many steps for blood donation. Therefore, the process to secure and satisfy must be concern.

Aims: The aim of this study was to evaluate turn around time for non-remunerated blood donation in Blood Transfusion Centre, Faculty of Medicine, Khon Kaen University, Thailand.

Methods: Retrospective study of turn around time for non-remunerated blood donation (N = 100) in Blood Transfusion Centre, Faculty of Medicine, Khon Kaen University, Thailand. The data was collected by walk in non-remunerated blood donor application. Statistical methods for Mean ± SD time period of (I) Waiting time for the screening room (II) Waiting time for blood donation (III) Time for blood donation (IV) Waiting time for rest in bed and (V) Waiting time for blood pressure check.

Results: Turn around time for blood donation is 44 ± 12 min. It can divide into (I) Waiting time for the screening room (II) Waiting time for blood donation (III) Time for blood donation (IV) Waiting time for rest in bed and (V) Waiting time for blood pressure check were 6 ± 4.5, ± 3, ± 2.6 ± 4 and 19 ± 10 min, respectively.

Summary/Conclusions: Forty-four minute for once blood donation is effective. The time for rest after blood donation is 19 ± 10 min, the non-remunerated blood donation will take only 25 min for finish the procedure. The satisfaction rate were more than 90%.

P-134

A BRIEF DISCUSSION ON THE EFFECT OF “GREEN” BLOOD DONATION IN SUMMER ON THE ALLEVIATION OF BLOOD SOURCE TENSION

X Su

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Background: A lot of people are reluctant to go out in the hot weather, which can lead to blood pressure and decrease in blood supply. The blood donors go to donation points have uncomfortable journey and saving time also; Green facilities, 95 percent of the respondents responded to the green hardware condition, the blood donation vehicle should be cool and ventilated to ensure that the blood donation is best suited to the temperature; Green decoration, 68 percent of the respondents mentioned improving the appearance of blood donation vehicles, the summer anxiety saw the green car accessories and red propaganda more pleasing to the eye; Green action, 67% of the investigators noted that blood stations can organize some fixed donors green exchange activities, some of the outdoor living collective activities actively, let fixed donors increase publicity of blood donation.

Summary/Conclusions: In response to the hot weather in summer, we should know the needs of the blood donors, promote the green blood donation, keep the blood source, raise the blood volume, and relieve the blood supply stress in summer.

P-135

ANALYSIS OF THE STATUS OF UNPAID BLOOD DONORS IN DALIAN WANDA BLOOD DONATION HOUSE FROM 2015 TO 2016

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Background: There is one of the important therapeutic methods to Safe lives in clinical is safe blood transfusion. With the rapid development of the national economy, the overall improvement of the medical level, blood transfusions has increased sharply. This phenomenon brings great pressure to blood transfusion services. The serious problems faced by blood transfusion services are to explore the potential of blood donors, expand the blood donation teams and develop the permanent blood donors. It is very important to analyze the regional blood donors to make specifically propaganda and recruitment for blood donation.

Aims: Dalian Wanda blood donation house was completed in late August 2014. This article mainly understands the status of unpaid blood donors in Dalian Wanda blood donation house from 2015 to 2016, which explores the effective way and benign mechanism of Wanda blood donation house unpaid blood donation work, and provides scientific basis for ensuring the future healthy development of blood donation in this area.

Methods: The data of unpaid blood donors in Dalian Wanda blood donation house were collected by SHINOW9.0 system. The data were analyzed by SPSS19.0 according to sex, age, educational level and occupation, which were compared by X² test, which was statistically significant by P<0.05.

Results: Male blood donors were significantly higher than females. 18-24 years old, undergraduate degree, students were the main blood donors without repayment in this region.

Summary/Conclusions: Wanda blood donation house is located in high-tech park. The main blood donors without repayment in this region had significant characteristics in terms of gender, age, educational level and occupation, to the surrounding college students as the main unpaid blood donors. Therefore, in the formulation of the recruitment strategy for blood donation and the work of blood donation, the appropriate recruitment strategies should be established accordingly to the students. However, it is not to be neglected to high-tech park staffers who will be the potential recruit, which to promote the comprehensive development of blood donation without compensation in Wanda blood donation house.

P-136

THE PRACTICE AND REFLECTION ON THE CREATIVE PROPAGANDA WORK OF VOLUNTARY BLOOD DONATION

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Blood Station of Juexing City, Juexing, Zhejiang Province, China

Background: To innovate and expand the content, ways of voluntary blood donation propaganda, will promote the sustained and healthy development of voluntary blood donation.

Aims: To innovate and expand the content, ways of voluntary blood donation propaganda, will promote the sustained and healthy development of voluntary blood donation.

Methods: Cooperating with the mass media, innovating the content of propaganda.

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P-137
INVESTIGATION ON BLOOD DONATION OF INSUFFICIENT BLOOD DONATION IN CHANGSHA IN 2016
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Background: Blood resources are precious. Blood physical waste (including hemolytic blood, blood fat, clots, breakage, precipitation, deficiency, etc.) has many conditions. The blood deficiency occupies a certain proportion. Although it cannot be eliminated, it cannot be prevented and controlled. Through statistics, in January 2016, different blood donors were not sufficiently distributed, and the basic situation of insufficient blood donation was mastered. To analyze the causes of insufficient blood donation, and to explore the prevention of insufficient blood donation, Reduce the rate of blood loss and the negative psychological impact on unpaid blood donors.

Aims: To understand the situation of insufficient blood donation in Changsha area, analyze the distribution of insufficient blood donation and discuss the reasons.

Methods: The statistical data of blood collection in 2016 was analyzed, including the insufficient blood donation, to assess the proportion and distribution of insufficient blood donation in different donors. Results: The proportion of insufficient blood donation in Changsha area was 1.32% in 2016. The distributions of insufficient blood donation, among donors in different genders, ages, occupations, blood quantities, and characters, had statistically significant differences.

Summary/Conclusions: The reasons for insufficient blood donation were analyzed and corresponding preventive measures should be taken. Improving the blood donation service, collection technology and the blood collection environment are helpful to reduce the occurrence of insufficient blood donation and save blood resources.

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Abstract has been withdrawn

P-139
DEVELOP MEDICAL SOUVENIRS AND RECRUIT MORE BLOOD DONORS
X Jun
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Background: In this age of scarcity, there has been no form of propaganda that can remain invincible for a long time. In recent years, the Imperial Palace Museum in Taipei has developed a lot of tourists through the development of cultural and creative products, which has greatly spread the traditional history and culture of the Imperial Palace. 

Aims: Blood centers should develop more souvenirs to recruit more blood donors.

Methods: Development of creative blood donation souvenirs to grasp the three elements: 1) Culture: Culture is the core. We should cultivate free blood donation and love, and use the new blood donation culture to cultivate donor culture. Through the blood donors’ cultural impression on the blood donation souvenirs, we can realize the dissemination and reappearance of the love culture.

Summary/Conclusions: The souvenir of blood donation carries the expression of social respect and gratitude for the blood donors. It has the unique significance and value in use. From a certain point of view, the design, the color of the blood donation issue full of souvenirs, the implementation of the new consumer love culture in blood donors, can play the effect of interpersonal communication, to recruit new and more potential donors.
FEATURES OF REGULAR BLOOD DONORS’ IRON METABOLISM

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Background: Since 2010, a state program to develop voluntary blood donation has been implemented in the Republic of Tajikistan, but a shortage of donors still persists. One particularly important problem is donation refusal for medical reasons. One of the most frequent causes of withdrawal from blood donations in the Republic of Tajikistan is low hemoglobin (Hb) rates. The frequency of withdrawals for this reason has ranged in different years from 3.9 to 7.4% and represents 29 to 36% of the total number of withdrawals. These high rates of withdrawal from donations are associated with the prevalence of latent iron deficiency, especially in women. Determining serum ferritin concentration, erythropoietin and soluble transferrin receptors amongst regular and withdrawn donors allows monitoring iron reserves.

Aims: To determine the metabolism of iron deficiency in regular blood donors.

Methods: The level of serum ferritin was defined in 800 regular donors (400 men, 400 women). 400 of them received additional iron for the prevention of anemia (group I), 400 – did not receive prophylaxis (group II). Hb concentrations in male donors were >110 g/l, female >120 g/l. In those donors who had withdrawn from blood donations due to low Hb (n = 100; 50 men and 50 women), serum ferritin, erythropoietin and soluble transferrin receptors were investigated. Hb levels in males were >110 g/l; <120 g/l in women. Donor’s ages ranged from 18 to 60 years old. In the group of donors who were rejected from donating blood due to low Hb levels, some were selected for the study by random sampling from the number of potential primary and regular donors. The concentration of serum ferritin was determined using radioimmunoassay, while erythropoietin and soluble transferrin receptors were determined by fluorescent immunological analysis.

Results: Serum ferritin levels in regular male donors were 65–130 ng/l; female – 45–100 ng/l. In group I donors, who were treated with 250–320 mg of preventive iron after blood and plasma donations, 250 donors observed an increase of serum ferritin levels, 138 donors observed unchanged concentrations, and there was a reduction observed in 12 female donors. In group II donors who did not receive iron supplementation, an increase in serum ferritin levels was observed in only 15 donors, while a decline was observed in 200, and levels were unchanged in 185 donors (mostly men). Hb levels in male donors who had been removed from donation were 114–126 g/l, in female donors – 92–116 g/l. A decrease in serum ferritin was diagnosed in 91 out of 100 donors; the mean value for males was 1.8 and for females 4.1 times lower than in the control group. In 74 donors serum ferritin did not exceed 14 ng/ml. Elevated levels of soluble transferrin receptors were detected in 36 out of 100 donors, which was also combined with a low content of serum ferritin. Soluble transferrin receptors values ranged from 27.62 to 54.22 nmol/l (standard 7.89–29.51 nmol/l), and the median exceeded the control level by 2.6 times and amounted to 40.57 nmol/l vs. 15.72 nmol/l in the comparison group. The concentration of erythropoietin was higher than the threshold in 45 out of 100 donors with low ferritin values. In 20 cases this was combined with a high rate of soluble transferrin receptors. The rest of the erythropoietin levels were within the normal values, however, the median was 2.4 times above the median of the control group.

Summary/Conclusions: Prophylactic iron use in regular blood donors provided the opportunity to minimize blood donation rejections associated with reduced hemoglobin levels.

INVESTIGATION AND ANALYSIS THE BASIC SITUATION OF APHERESIS PLATELET DONATION IN WENZHOU CITY

C. Lian

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Background: With the rapid development of the blood transfusion medicine and technology, the traditional transfusion fundamental change, the concept and mode components become the development direction of scientific and safe blood transfusion, and machine by platelets in the treatment and prevention of scientific curative effect of the blood coagulation dysfunction, is widely applied in clinical treatment. In recent years, Wenzhou region machine adopt platelet clinical rising demand, the obvious contradiction between supply and demand, in order to fully understand the present situation of the machine adopt the platelet donors team, improve the work of recruiting retention, guarantee the adequate and safe for clinical use Wenzhou region of the author in 2014–2016 machine adopt platelet donors analysis of the basic situation of the investigation.

Aims: To know the basic situation of apheresis platelet donation in local area, to provide reference for the establishment of a stable team of blood donors.

Methods: The study of 21, 113 blood platelet donors who successfully donated platelets during the 2014–2016 period, using the software of Zhejiang province blood management and control information system BIS2.0, to investigate and analyze the basic situation of apheresis platelet donation.

Results: The gender, age, cultural degree and occupational all influence the blood donors in Wenzhou area, between 2014 and 2016, the proportion of men and women in the Wenzhou area was maintained at 15.7:1–13.6:1, among them the age of 26–45 was 71.3 percent of the blood donors, the cultural degree of blood donor

Blood Collection Incl. Apheresis

ANALYSIS ON THE TRENDS AND CHARACTERISTICS CHANGE OF PLASMA COLLECTION IN CHINA

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Background: The shortage of resource plasma is still the main factor that restricts blood products in China. The restriction and influence of government policy has an important impact on the plasma collection. It would have a huge effect on plasma collection that a series of policies of some provinces in recent years, including shutting down parts of plasma collection centers in Guizhou and providing a initiate promotion measure in Guangdong. This study analyzed the trends and the characteristics change of plasma collection under the effect of local policies of China in recent years.

Aims: To find out the characteristics change of the plasma donors in China under the influence of local collection environmental changing. We analysed these results and trends to predict the development of plasma collection in future.

Method: Comparing and analysis were carried out for the national plasma collection data from 2011 to 2015 by statistical methods. The national data included the number of plasma donors, the quantity of plasma and the occupation distribution of the donors from 2011 to 2015.

Results: The total amount of the national plasma collection in 2015 was nearly 1.5 times that of 2011. The average annual growth rate of national plasma collection was 16.65%, and the average annual growth rate of the number of donors was 15.69% during the 5 years. The top five provinces (except Guizhou) with the volumes of plasma collection remained unchanged, but their proportion decreased from 66.98% to 53.5% during the period of 2011 to 2015. The annual growth rate of traditional plasma collection regions has decreased year by year, while the growth rate of other provinces has increased year by year like Guangdong, Xinjiang and Chongqing. In particular, the growth rate of Guangdong province reached 127.91% in 2015. The annual national frequency of plasma donation per person was 5.6 during the period of 2011 to 2015. And the annual frequency has decreased from 6.1 to 5.0 since 2012. This phenomenon appeared in most provinces, and the average fall of these provinces was 23.3% in 2015 compared with 2011.

Farmers is still selected as the major objects for plasma donation in China accounting for more than 80% of the total amount of donors, but the occupation proportion has begun to change significantly due to the proportion of farmers which has decreased from 89.11% in 2011 to 82.96% in 2015. The proportion of workers and other occupations rose from 1.84% to 4.12% and from 6.84% to 10.71% respectively. The proportion of farmers in most provinces has been decreased in different degrees except the three provinces in the northwest China and a few agricultural provinces.

Blood Collection Incl. Apheresis

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was high school and secondary school (31.79%) in the first, the percentage of low-educated blood donors is decreasing year by year (see table 2), the highest proportion in terms of occupational distribution is employees of the enterprises, freelance residence in the second (29.00%), in the last 3 years, the rate of double platelet donation was increased from 4.11% to 20.01%, however, there was no statistical difference in the rate of blood donation reaction.

Summary/Conclusions: Among blood platelet donors in the Wenzhou area women, higher education, students and institutions have a lower proportion of employees, further mobilization is needed in the future, double platelet donation is lower, still have tremendous room for improvement, there are some unreasonable places in the structure of blood platelet donors, should appropriate adjustment and improvement of current recruitment priorities, develop a local advertising recruitment strategy, to ensure adequate and safe blood supply.

Methods: To observe and compare the characteristics of relative blood donors and non-relative blood donors, and to analyze the related factors of relative blood donors and non-relative blood donors.

Results: Compared with the staff, relative blood donors were more man than woman, the composition of the staff has nothing to do with the age and education level, and the enthusiasm of non-relative blood donors was positive correlation to their educational levels. 2. Comparison of blood from the motivation, the first blood donation more than repeated blood donors (P<0.01), 3. From the psychological attitude comparison, family members donation blood donation motivate to “family friendship” mostly, significantly more than other reasons (P=0.01), voluntary unpaid blood donors are “dedicated love” majority, significantly more than other reasons (P<0.01). The rate of blood donation was significantly higher than that of voluntary blood donation.

Aims: To analyze the differences between relative blood donors and non-relative blood donors.

Methods: To observe and compare the characteristics of relative blood donors and non-relative blood donors, and to analyze the related factors of relative blood donors and non-relative blood donors.

Summary/Conclusions: Among blood platelet donors in the Wenzhou area women, higher education, students and institutions have a lower proportion of employees, further mobilization is needed in the future, double platelet donation is lower, still have tremendous room for improvement, there are some unreasonable places in the structure of blood platelet donors, should appropriate adjustment and improvement of current recruitment priorities, develop a local advertising recruitment strategy, to ensure adequate and safe blood supply.

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CONTRAST ANALYSIS BETWEEN RELATIVE BLOOD DONORS AND NON-RELATIVE BLOOD DONORS
SY Feng, H Wenzia, Z Nan and W Nan
Inner Mongolia, Hohhot, China

Background: With the continuous increase in clinical blood, all around free of charge. Blood donation has been unable to meet the needs of clinical blood, in this case, mutual blood donation as a first aid and Clinical health needs of a special model, but there are still some differences with the group of free blood donors, so to expand the blood donation team.

Aims: To analyze the differences between relative blood donors and non-relative blood donors.

Methods: To observe and compare the characteristics of relative blood donors and non-relative blood donors, and to analyze the related factors of relative blood donors and non-relative blood donors.

Results: Compared with the staff, relative blood donors were more man than woman, the composition of the staff has nothing to do with the age and education level, and the enthusiasm of non-relative blood donors was positive correlation to their educational levels. 2. Comparison of blood from the motivation, the first blood donation more than repeated blood donors (P<0.01). 3. From the psychological attitude comparison, family members donation blood donation motivate to “family friendship” mostly, significantly more than other reasons (P=0.01), voluntary unpaid blood donors are “dedicated love” majority, significantly more than other reasons (P<0.01). The rate of blood donation was significantly higher than that of voluntary blood donation.

Summary/Conclusions: Among blood platelet donors in the Wenzhou area women, higher education, students and institutions have a lower proportion of employees, further mobilization is needed in the future, double platelet donation is lower, still have tremendous room for improvement, there are some unreasonable places in the structure of blood platelet donors, should appropriate adjustment and improvement of current recruitment priorities, develop a local advertising recruitment strategy, to ensure adequate and safe blood supply.

P-145
BLOOD DONOR DEFERRAL PATTERN IN ISLAMABAD, PAKISTAN
U Wahheed and H Abbas Zaheer
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Background: The increasing demand of blood and blood products in developing counties like Pakistan reflect the need for mobilization of more voluntary blood donors. The donor selection process requires continuous monitoring to ensure that it achieves its objectives of ensuring donor and recipient safety and providing a sufficient supply of blood and blood components. The blood donors are deferred from blood donation for numerous reasons, either permanently or temporarily. Knowledge of the reasons for donor deferral can help in planning more effective recruitment and retention campaigns aiming at the availability of safe donors. Blood donor deferral leads to loss of available blood units for transfusion.

Aims: To assess the blood donor deferral pattern in the capital city of Islamabad.

Methods: This was a retrospective study conducted through the data reported to IBTA from the 20 licensed blood banks of Islamabad during the period Jan – Dec 2016. Data were entered into SPSS (version 2.0) and frequencies of each causes of deferral were calculated.

Results: Data of 71.78% blood donors who came to donate at the 20 licensed blood banks or the camps organized by these blood establishments of Islamabad were analyzed. Among these donors, 68,274 (95.1%) were selected for blood donation after physical and behavioural screening, 3,521 (4.9%) blood donors were deferred (temporary n = 2,279, permanent n = 742) from blood donation at this stage. In addition, 2,538 blood donors were deferred permanently after post donation serological screening on the basis of Transfusion Transmissible Infection reactivity. The pre-donation deferral rate was considerably higher among females (59.5%) compared to (40.5%) males.

The causes of pre-donation deferral were Anemia 39.0% (n = 1,113), Under Weight 16.6% (n = 474), Inappropriate Height Weight Ratio 0.8% (n = 22), Menstruation 5.2% (n = 148), Low Blood Pressure 1.1% (n = 30), Taking Medicines 1.5% (n = 43), H/O Fainting/Vertigo 0.5% (n = 15), Recent Vaccination 1.2% (n = 35), Recent Blood Donation 4.9% (n = 127), Underweight/Overweight 5.7% (n = 163), Flox/RTI 1.4% (n = 39), Gastroenteritis 0.6% (n = 18), Typhoid 0.9% (n = 13), Hypertension 1.6% (n = 45), Arthritis 0.4% (n = 12), Chest Pain 0.01% (n = 1), Difficult Vein/Osophagus 0.8% (n = 22), Blood Phobia 0.9% (n = 25), Fever 1.1% (n = 31), Fasting 0.4% (n = 11), Fear of Needle 0.2% (n = 6), Without Breakfast 3.1% (n = 90), Known H/O Hepatitis B and C 0.4% (n = 11), Asthmatics 0.8% (n = 24), and others (e.g. heart diseases) 15.4% (n = 413). With regards to the causes of post-donation deferral, 110 (0.16%) were reactive for HIV, 894 (1.31%) for Hepatitis B and 1,187 (1.74%) were reactive for Hepatitis C virus. 0.14% were reactive for Malaria and 0.72% for Syphilis.

Summary/Conclusions: Credible scientific data of an important urban city, Islamabad, generated by a regulatory authority indicates that about 5.1% of the blood donors who presented for blood donations were unfit for donations temporarily or permanently. This study therefore underlines the need to focus on retention of suitable voluntary as well as replacement donors in addition to further strengthening donor management systems.

P-146
STUDY ON THE INTERVENTION EFFECTS OF CHYLEMIA IN APHERESIS PLATELET DONORS
Q Zhou and J Zhang
Blood Collection, Beijing Red Cross Blood Center, Beijing, China

Background: According the China national standard GB18469-2012 Quality Requirements for Whole Blood and Blood Components that blood components shall be no severe Chylemia which has evidence to impact the effect of blood transfusion. In Beijing Red Cross Blood Center, chylemia cause 25.5% of apheresis platelet (AP) donor deferral, which waste the blood resources and impact the passion of AP donors.

Aims: To study the effects of different intervention measures on AP donors who have chylemia at first screening, and specify priority intervention measures to increase the platelets collection.

Methods: To intervene of AP donors who have chylemia with the diet education, drinking more water, and do exercise at our blood center from April 2015 to November 2016, and to analyze the intervention effects.

Diet education: Provide diet education to AP donors who have chylemia. To do the test again at next day and evaluate the intervention effects.

Drinking-water method: donors drink water (3–5 cups) within 2 h and do the test again.

Exercise and Drink water method: donors do exercises (brisk walk for 20 min.) and drink water (3–5 cups). Do the test again 2 h later.

Results: For AP donors who have mild chylemia, the donation rate after diet education and exercise method were similar, with the success donation rate of the three methods were 87%, 83.3% and 82.9%, respectively. There were no significant difference between two methods. The success donation rate of the drinking-water method was 77.4%. For AP donors who have moderate chylemia, the donation rate after diet education and exercise method were 90% and 93.8%, respectively. There was no significant difference between the three methods. The success donation rate of the drinking-water method was 77.4%. For AP donors who have severe chylemia, the intervention effects of the drinking-water method and the exercise method were similar, with the success donation rate of 51.4% and 54.2%, respectively. While 90% of AP donors who intervention with the die method donate AP successfully when they come to donate at next day; obvously, the intervention effect was much better than those of the other two methods.

Summary/Conclusions: Deferral of apheresis platelet donors caused by chylemia can be intervened. There are different chylemia intervention methods. Consider the operation conventional, For AP donors who have mild chylemia, the drinking-water
method can be used. For those who have moderate cholelithiasis, the drinking-water method or exercise method may be used. The dietary intervention method should be considered as the first choice for those who have severe cholelithiasis. Intervening in cholelithiasis could reduce the occurrence of AP donation deferral, save cost, and increase AP collection volume. At our blood center, the AP donors who have cholelithiasis, but intervention successfully increased 2% AP collection since 2015.

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Abstract has been withdrawn

P-148
FACTORS AFFECTING PLATELET YIELD DURING PLATELETHESIS DONATIONS
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Background: High-yield plateletpheresis enables the collection of multiple units from the same donor in a single donation and may have the potential to reduce donor exposure, risks inherent with allogeneic transfusion, effective management of platelet inventory and cost effectiveness of the procedure

Aims: This study was conducted to assess the factors affecting platelet yield and quality of product during Plateletpheresis donations.

Methods: A total of 500 plateletpheresis donors were included in this prospective study. All procedures were performed using a fully automated platform of plateletpheresis, Trima Accel version 5.1 (Gambro BCT), Amicus Crescendo version 3.2 ( Baxter Healthcare Corp.). The parameters assessed were donor physical characteristics, pheresis, Trima Accel version 5.1 (Gambro BCT), Amicus Crescendo version 3.2 (Baxter Healthcare Corp.). The parameters assessed were donor physical characteristics, hematological profile (pre donation) and the procedural variables with the platelet yield of the product harvested and divided into two groups Group-I (54 × 10^9/l, n = 318) and Group-II (4 × 10^9/l, n = 182).

Results: A total of 500 prospective plateletpheresis donors (age range 18-56 years) were enrolled. In our study actual platelet yield was positively correlating with the weight (r = 0.155) of the donors [Group-I (72.47 ± 9.72) and Group-II (75.37 ± 9.98)], and height (r = 0.129) of the donors [Group-I (170.31 ± 4.29) and Group-II (171.46 ± 5.14)] and is statistically significant (P < 0.01). Actual platelet yield harvested is negatively correlating with the Hb (r = -0.15) and Hct (r = -0.59) but was not statistically significant (P > 0.05). [Group-I (14.93 ± 0.98 g/dl) and (43.60 ± 2.74%) and in Group-II (14.49 ± 0.98 g/dl) and (43.22 ± 2.64%)]. Actual platelet yield was positively correlating with the pre donation platelet count (r = 0.624) of the donors and was statistically significant (P < 0.01). [Group-I (3.19 ± 0.436 × 10^9/l] Group-II (2.86 ± 0.505 × 10^9/l]. Procedural parameter, blood volume processed (r = 0.706) [Group-I (248.67 ± 389.698 ml), Group-II (1320.10 ± 502.87 ml)], was highly correlating with the actual platelet yield harvested and was statistically significant (P value < 0.01).

Summary/Conclusions: Pre donation platelet count and blood volume processed are the main predictables of platelet yield. Hence donors with pre procedure platelet counts (≥2 × 10^11/l) with higher body surface area can be considered for higher yield platelet products.

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THE INFLUENCE OF DONOR LEUKOCYTE CLASSIFICATION ON COLLECTION OF PERIPHERAL BLOOD MONONUCLEAR CELLS
P Xiang, J Liu and Z Gao
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Background: The malignant tumor seriously endangers the human body health, and receives the widespread attention. At present, there are four main methods for the treatment of malignant tumors, including surgery, chemotherapy, radiotherapy and immunotherapy. Dendritic cell based immunotherapy has become an important and effective way to fight cancer. At present, the main way to obtain dendritic cells is through the differentiation and culture of peripheral blood mononuclear cells. The application of blood cell separator for peripheral blood mononuclear cells has a very important application prospect. Peripheral blood mononuclear cells, including monocytes and lymphocytes, are the two main cells in the classification of leukocytes. In this study, peripheral blood mononuclear cells were collected by five blood cell separators, and the effect of donor leukocyte classification on peripheral blood mononuclear cells was investigated.

Aims: To investigate the effect of donor leukocyte count and classification on peripheral blood mononuclear cells collected from five kinds of blood cell separator.

Methods: With MCS-, COBE Spectra, Amicus, COMTec and Spectra Optia five kinds of blood cell separator MNC acquisition program to collect peripheral blood mononuclear cells, compare the total number of white blood cells and classification in products and volunteers collected before, analysis the effect of white cell count and classification on the number of MNC in product acquisition using five kinds of blood cell separator.

Results: The total number of white blood cells had no significant effect on the MNC number of five kinds of blood cell separator. COMTec, Amicus, MCS- three kinds of blood cell separator MNC number of products and pre harvest lymphocyte count was positively correlated, correlation coefficient were 0.828, 0.783, 0.672, P < 0.05, the difference was statistically significant.

Summary/Conclusions: Using five kinds of blood cell separator to collecting peripheral blood mononuclear cells, volunteers before harvest white blood cell classification and product MNC number are closely related.

P-150
COMPARISON OF THE AMOUNT OF GRANULOCYTE INTERFUSION BETWEEN FIVE BLOOD CELL SEPARATORS FOR COLLECTING MONONUCLEAR CELL PRODUCTS
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Background: Peripheral blood mononuclear cells are used for biological treatment of tumor patients or for culturing dendritic cells for the study of cellular immunity vaccines, etc. However, the researchers found that the incorporation of granulocytes and platelets in the initial cultures of mononuclear cell (MNC) greatly affected the differentiation and development of DCS. The characteristics of platelets are different from those of mononuclear cells, which are easier to remove, but the effects of granulocytes are difficult to remove. Therefore, in this study, we compared the amount of granulocyte incorporation in peripheral blood mononuclear cells from five blood cell separators in order to provide the basis for optimizing the collection of peripheral blood mononuclear cells.

Aims: To compare the amount of granulocytes mixed in peripheral blood mononuclear products collected by MCS-, COBE Spectra, Amicus, Spectra Optia and COMTec five kinds of blood cell separators.

Methods: Peripheral blood mononuclear cells of volunteers were collected by MNC program of five kinds of blood cell separators, MCS-, COBE, Spectra, Amicus, Spectra Optia and COMTec. Measured the amount of granulocyte interfusion in the mononuclear cell products prepared by five kinds of blood cell separators respectively, and compared the difference of the amount of granulocyte mixing in the products collected by the blood cell separators.

Results: In the mononuclear cell products collected by five kinds of blood cell separators, MCS- was more than that of the other four kinds of blood cell separators. The difference was statistically significant (P < 0.05). Moreover, the percentage of mononuclear cells collected by MCS- was lower than that of the other four blood cell separators (P < 0.05). In the acquisition time, Amicus acquisition time was the longest, MCS- acquisition time was second, COBE, Spectra, COMTec and Spectra Optia acquisition time were shorter, the difference was statistically significant (P < 0.05).

Summary/Conclusions: Because of the performance and type of the blood cell separator were different, the quality and efficiency of collecting the mononuclear cell products were also different. In the premise of ensuring the quality and efficiency, we should choose the type of blood cell separator with a small amount of granulocytes to collecting peripheral blood mononuclear cells. At the same time, adjust the machine corresponding acquisition parameters, strengthen the quality control, could make the amount of granulocytes lowest mixing in the products.

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Abstract has been withdrawn

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P-152
FREQUENT PLATELETPHERESIS AND ITS IMPACT ON THE HEMATOLOGICAL PARAMETERS: AN OBSERVATIONAL STUDY
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Background: Frequent plateletpheresis donors are assets for the blood banks. The well-being of these donors has been a matter of concern.

Aims: In our study we intend to analyze the effect of plateletpheresis on the hematological parameters of these donors assessed prior to each subsequent procedure. We also try to compare the effect of 3 cell separators used for plateletpheresis on the post donation hematological parameters.

Methods: The study was conducted during February 2016 to March 2017 on all the repeat plateletpheresis donors coming to the Department of Transfusion Medicine for the 2nd time within a month of the first plateletpheresis. The values of the hematological parameters including red cell and platelet indices tested prior to each plateletpheresis were entered into the excel sheet and gap between each donations were calculated. The plateletpheresis were done either on Hemonetics MCS separators (Hemonetics Corporation, Braintree, Massachusetts, USA) Fresenius separator (Fresenius HemoCare GmbH, Bad Homburg v.d.H, Germany) and Gambro Trima Accel, software version 5.0 after taking consent from the donors. The target collection of each procedure was a dose of 3 × 10¹¹ platelets in 200–250 ml of plasma. To compare the effect of the cell separators on the hematological parameters due to the plateletpheresis, parameters at 2 consecutive donations within 7 days were considered. Data was analyzed by Stata 14. Within change in the continuous variables were assessed by paired t-test and between two groups comparison was done by independent t-test or Wilcoxon Rank Sum test. The comparison among the cell separators was done by Kruskal-Wallis test or one way ANOVA. P-values < 0.05 were considered significant.

Results: Of the 98 donors, 35 repeated the plateletpheresis within a week (group I) and 63 underwent 2nd plateletpheresis within 8–30 days (group II). No significant alteration was found in the red cell or the platelet indices within either group but a significant difference in the variation of platelet counts of the 2 groups (P = 0.025). Though above the eligibility cut-off of 1.5 lakhs/ml, platelet counts were lower than baseline in group I donors whereas it was higher at 2 nd plateletpheresis in group II donors. There were 49 donors who presented to us for the 3 rd time for plateletpheresis with a mean gap between 1 st and 3 rd plateletpheresis being 46 days. No significant difference in the parameters assessed prior to any of the plateletpheresis was found except the platelet distribution width (P = 0.006). Plateletpheresis through all the 3 cell separators had similar effects on the hematological parameters. Post donation follow-up hematological parameters were not affected by the cell separators used for plateletpheresis.

Summary/Conclusions: There was no significant change in the hematological parameters in the plateletpheresis donors who underwent frequent plateletpheresis. Post donation follow-up hematological parameters were not affected by the cell separators used for plateletpheresis.

P-153
THE METHOD AND EFFECT OF IRON RESUPPLY OF LONG-TERM PLATELET DONORS
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Background: Most plateletpheresis donors are the relatively fixed blood donors. More care should be given to the blood donors, so that to establish a stable platelet donors.

Aims: To investigate the causes of non-standard volume of blood, to provide a basis for targeted measures.

Methods: The statistical analysis was made on the causes of 272 cases of non-standard volume blood in 55374 donors from January 2015 to January 2017.

Results: Blood donation-related side effects accounted for 61.8%, blood collection technique problems accounted for 30.1%.

Summary/Conclusions: Effective relief of blood donors tensions and improved nurses’ blood collection techniques are important to reduce the collection of non-standard volume blood.

P-154
ANALYSIS AND PREVENTION OF NON - STANDARD VOLUME BLOOD
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Background: Every year a large number of non-standard volume of blood is collected, these non-standard volume of blood collection will result in a huge waste of blood resources.

Aims: To investigate the causes of non-standard volume of blood, to provide a basis for targeted measures.

Methods: The statistical analysis was made on the causes of 272 cases of non-standard volume blood in 55374 donors from January 2015 to January 2017.

Results: Blood donation-related side effects accounted for 61.8%, blood collection technique problems accounted for 30.1%.

Summary/Conclusions: Effective relief of blood donors’ tensions and improved nurses’ blood collection techniques are important to reduce the collection of non-standard volume blood.

Donor Adverse Events

P-155
DONOR HEMOVIGILANCE: HAVE WE GOT THE FIGURES RIGHT?
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Background: Donor hemovigilance is an important aspect for any blood transfusion facility. Based on the time of occurrence it can be classified as acute or delayed. Delayed adverse reactions occur 24 h after the donor has left the donation site. The transfusion service is aware only in case a donor informs back to the facility leading to an underreporting of the donor adverse events.

Aims: This prospective study aims to know the incidence and types of delayed donor reactions and the risk factors associated with it, amelioration of which would improve the donor return rate.

Methods: The study was conducted prospectively for a period of May 2016 to December 2016 at the Department of Transfusion Medicine, Indraprastha Apollo Hospitals, New Delhi. One thousand blood donors who donated blood at our center during the said period were randomly selected and a telephonic call was made to enquire about the feedback and the central tendencies were analyzed. Root cause analysis (RCA) was done to identify the risk factors associated with the adverse events. Their previous donations and any previous adverse events, if any, were also enquired about.

Results: Thirteen hundred and fifty four donors were called of which 354 (26%) did not respond to the telephonic calls. Forty-eight (13.5%) telephonic numbers were incorrect and the rest did not answer the call. Of the 1000 donors who responded, 984 (98.4%) were males and 16 (1.6%) females. The mean age group was 30 (range: 18–61 years). Four (0.4%) donors reported hematoma formation. Other causes of hematoma formation like lifting heavy weights was ruled out. Of them, 2 had moderate pain for which they took medication. There was no other sensory or motor deficit. The hematoma faded within 4–7 days of time in all of them. On RCA it was found that the hematomas were a result of the new nursing staff appointed. She was counseled and trained further to prevent any such adverse event.

Summary/Conclusions: Call back policy was effective in bridging the gap between the actual donor reactions encountered and the one reported. It led to the RCA which strengthened our lacunae and improve our services to retain the blood donors in the pool and prevent their drop outs because of adverse events.

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Abstract has been withdrawn
EVALUATION OF ADVERSE EVENTS ASSOCIATED WITH BLOOD DONATION AMONG THE BLOOD DONORS
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Background: Although the blood donation process is usually safe and uncomplicated, occasionally adverse events of variable severity may occur during or after the collection. Adverse events have negative impact on donor recruitment and retention.

Aims: To assess the frequency and type of adverse events at our center, we analyzed all the adverse events associated with the blood donation among the whole blood and apheresis donors.

Methods: Blood bank based cross sectional analysis of adverse events was done in blood donations during the period of July, 2015 to June, 2017. These included 55,601 blood donors who were analyzed and subsequently compared for common adverse events like hemotoma, vasovagal reaction or syncope, nausea, vomiting, tetany, etc. The data were statistically analyzed using SPSS version 16 and suitable tests of significance applied.

Results: Total 1018 adverse events were observed among 55,601 whole blood donors (1.83%) Incidence) and 2 adverse events were observed among 251 apheresis donors (0.79%). VVR (syncope) of mild intensity was most commonly observed in whole blood donors (1.11%) specially in first time donors (0.97%) followed by hemotoma (0.40%), nausea (0.09%), vomiting (0.02%) and others (0.01%). Among the apheresis donors 1 mild and one moderate VVR was observed. The incidence of adverse events in all the categories of whole blood donors, compared with male versus female donors, was not found statistically significant; (P = 0.05). The incidence of adverse events was significantly higher among first-time-donors (4.6%) compared with those having H/o previous donation (2%); (P < 0.05). Among the apheresis donors who had adverse reactions, 1 was first time donor and 1 had a H/o donation in the past. Summary/Conclusions: Vasovagal reactions (Syncope) of mild intensity was found to be the most common adverse event associated with blood donation which was significantly higher (P < 0.05) among first-time donors compared with those having H/o previous donation. Obtaining such data on incidence of adverse events enables to train and prepare personnel in the phlebotomy area to respond quickly to those reactions to improve safety and comfort of the donor. Also it helps in minimizing negative impact on donor recruitment and retention, thereby improving blood donor return rate.

ANALYSIS OF VASOVAGAL REACTION OCCURRENCE RATE IN DIFFERENT AGE OF BLOOD DONORS IN YINCHUAN REGION FROM 2014 TO 2016
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Background: The safety of donor is an essential prerequisite to increase voluntary blood donation.

Aims: To investigate the occurrence rate of vasovagal reaction among the blood donors during the last 3 years in Yinchuan region, and to analyze how the donor characteristics (age, gender, first-time/repeat donation) associated with such adverse event, in order to provide a scientific basis for exploring preventive measures and reducing the occurrence of adverse reactions.

Methods: 208 cases of vasovagal reaction recorded from January 2014 to December 2016 of Yinchuan region were collected for statistical analysis of blood donors associated reaction rates in different years, frequency, gender and age groups.

Results: From 2014 to 2016, the adverse reaction of blood donation in Yinchuan decreased year by year. The adverse reaction occurrence rate of first-time donor was higher than repeat donor. In general, females had a higher rate than males, especially for those aging from 18 to 24. There was an obvious difference among different range of ages.

Summary/Conclusions: Adverse event analysis helps in identifying the blood donors at risk of donor reactions and adopting appropriate donor motivational strategies, pre-donation counseling, and care during and after donation. For donor retention purpose, prevention and coping techniques should take gender and age differences into account.

THE EFFECT OF RIGOROUS SCREENING IN PREVENTION OF AHERESIS ADVERSE EVENTS BEFORE BLOOD COLLECTION
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Background: Adverse events often occur in apheresis, we should be familiar with the causes, types and clinical manifestations of adverse events caused by apheresis platelets, and targeted screening, in order to reduce the adverse effects of blood donation by apheresis. It is significant for preventing and reducing the adverse events of apheresis platelets donation.

Aims: In this paper we would like to explore how to prevent and reduce the adverse events of apheresis donation, through investigating and analyzing the causes and clinical manifestations of adverse events of apheresis donors.

Methods: According to “Whole blood and component donor selection requirements” GB 18467-2011, and “Quality requirements for whole blood and blood components” GB 18469-2012, we would like to select donors who meet the conditions of apheresis platelets, as well as collect single (double) therapeutic doses platelets, analyzing the reasons by selecting blood donors who took the blood donation adverse events.

Results: Adverse events of citrate are the main types of apheresis platelets donation, January 2016–December 2016, apheresis donors were 5669 people, only 1.3% of donors have mild side effects, when screening was performed before blood collection.
Comprehensive nursing measures were used for analysis and demand for clinical blood. While the implementation of comprehensive care measures, physical, psychological, environmental and other aspects and issuing questionnaires. Blood donors' satisfaction were improved through the implementation of comprehensive care measures to adapt and make people to achieve the best health status. Comprehensive nursing measures are based on modern medical model and implementing comprehensive nursing measures have an important role and significance.

Background: China implements unpaid blood donation system since the promulgation of "blood donation". The crowd of voluntarily joining the unpaid blood donation team is increasing. But with the sharp increase in clinical blood volume, the blood donation of blood donors and satisfaction degree, reduce the incidence of blood donation reaction, help to expand and stabilize the ranks of unpaid blood donors.

Methods: According to the requirements of the health check blood donors in Changsha blood center, from January 2015 to June and from January 2017 to June, to retrospectively analyze the qualifications for blood donors, each 6000 people, according to the three blood cell separator randomly assigned to each group of 2000 people, between January 2015 and June, those who do not take special measures to set as the control group, from January 2017 to June, those who take special measures to set as observation group, the proportion of statistical comparison of adverse reactions occur.

Results: The incidence of adverse reactions in special measures in 2017 was significantly lower than that in 2015 (P < 0.05).

Summary/Conclusions: The correct preventive measures can prevent adverse reactions effectively, improve the comfort level of blood donors, and play an important role in the retention of blood donors.

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THE COMPARISON AND PREVENTION OF THE ADVERSE REACTION OF PLATELETS FROM BLOOD CELL CENTRIFUGES

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Background: Accidental adverse reactions during apheresis platelet collection affect not only the quality of platelet, but also the retention and development of apheresis blood (AP) donors.

Aims: Through the retrospective analysis the adverse reaction number and types of three kinds of blood cell separators during blood donation, to explore the causes, formulate the relative prevention measures, reduce the incidence of adverse reactions, retention of blood donors.

Methods: According to the requirements of the health check blood donors in Changsha blood center, from January 2015 to June and from January 2017 to June, to retrospectively analyze the qualifications for blood donors, each 6000 people, according to the three blood cell separator randomly assigned to each group of 2000 people, between January 2015 and June, those who do not take special measures to set as the control group, from January 2017 to June, those who take special measures to set as observation group, the proportion of statistical comparison of adverse reactions occur.

Results: The incidence of adverse reactions in special measures in 2017 was significantly lower than that in 2015 (P < 0.05).

Summary/Conclusions: The correct preventive measures can prevent adverse reactions effectively, improve the comfort level of blood donors, and play an important role in the retention of blood donors.
CAUSE ANALYSIS, PREVENTION AND TREATMENT OF ADVERSE REACTION OF BLOOD DONATION

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Background: Observed from blood donation work, adverse reactions occurred during the blood donation caused by various factors damp donors’ enthusiasm and are not conducive to retain the donors.

Aims: To analyze the causes of adverse reactions of blood donation, to optimize the quality of blood donation service and improve the ability of treating blood donation adverse reactions.

Methods: Based on a retrospective analysis of a total 1087 cases of adverse reactions occurred during the blood donation from January 2015 to December 2016. Results: Among the 1087 cases of adverse reactions of blood donation, 726 (66.8%) were caused by mental factors, 184 (16.9%) were caused by physiological factors and 76 (7.0%) were caused by environmental factors. 58 (5.3%) were caused by blood collection operation factors, and the rest 43 (4.0%) were caused by other reasons.

Summary/Conclusions: The most common cause of adverse reactions occurred during the blood donation in our center is mental factors, followed by physiological factors, environmental factors, blood collection technology factors. We should give blood donors a positive psychological treatment, consult about donor’s physical status carefully, improve the blood donation environment and our blood sampling staff’s operational level. We can bring the donors a safer and more comfortable experience by providing quality services, preventing adverse reactions and conducting correct treatment of adverse reactions.

Blood Products

Blood Processing, Storage and Release

APPLICATION OF MODERN DAY TECHNOLOGIES – EVERY STEP COUNTS

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Background: Standardized processing protocols and automatization is a link to the efficacy of blood components. A positive effect on a recipient is the most important feature of them. Initial step in processing is drawing blood on automatic blood mixers, automatic strippers, sealers and automatic separation provide high quality blood components, together with GMP in routine work. Top & bottom (T/B) quadruple bags, we have been processing only RBC BCR-AS and RBC LD-AS. From 2013 we have implemented in our laboratory pooling 4 iso-group interim platelet units or 1-2 random platelet concentrate from top-bottom method and 3-2 interim platelet units pooled by Reveos pooling set, Comparison the value of volume, hematocrit, platelet contents and white blood cell contamination of LDPRC and LDPC at first installation to date with SPSS statistics.

Methods: Blood was processed using the Reveos system and compared accordingly.

Results: 408 whole blood was processing with Reveos system. Average of fresh frozen plasma, interim platelet and leuko-packed is 217.52+62.40 and 10.2 mL, respectively. The platelet index more than 60 cells/u is 75.8%. The quality of LDPC: hematocrit equal 55.8%, volume equal 313 mL and white cell contamination equal 0.0 × 106 cells/u. Comparison the value with SPSS statistics were found that the hematocrit, volume and white blood cell was processed with Reveos system. Average of fresh frozen plasma, interim platelet and leuko-packed is 217.52+62.40 and 10.2 mL, respectively. The platelet index more than 60 cells/u is 75.8%. The quality of LDPC: hematocrit equal 55.8%, volume equal 313 mL and white cell contamination was 0.0 × 106 cells/u. Comparison the value with SPSS statistics were found that the hematocrit, volume and white blood cell contamination was 0.0 × 106 cells/u.

Summary/Conclusions: The production of Reveos system, LDPRC and LDPC at first installation provides reached the recommended quality of Council of Europe (EU), American Association of Blood Banks (AABB) and National Blood Centre, Thai Red Cross Society (IRC).
Aims: To evaluate the quality of blood components (RBC, plasma and platelets) prepared by Reves system.

Methods: Fifty-one WB donations (450 mL ± 10%) were collected into Reves collection bag (Reves 3C Kit, TerumoBCT) and processed by Reves system using “3C” protocol on Day 1 after overnight-held at 18-24°C. RBC units prepared were leucodepleted with integrated leukofilters, suspended in SAGM and stored in DEHP-PVC containers. These products were tested for quality control (QC) parameters including total haemoglobin (Hb), residual white blood cell (WBC) count on Day 1 and haemolysis at expiry on Day 42. The plasma prepared were tested for cellular contamination (platelet, RBC and WBC), volume and coagulation factor VIII (FVIII) activity. Four units of IPU were selected for pooling based on platelet yield index (PYI) and leucodepleted using TerumoBCT platelet pooling set with inline leukofilter (ATREUS PLT Pooling set, LRFXL) and suspended in 200 mL of platelet additive solution (T-PAS), TerumoBCT in butyryl triethyl citrate-PVC container. The pooled and filtered platelets (PFPFT) were tested for absolute platelet count and pH at expiry (Day 5) and residual WBC count on Day 1. Four units of randomly selected leucodepleted RBCs and 4 units of PFPFTs were cultured for bacterial screening (Bact/Alert, bioMerieux) on Day 2.

Results: Regarding leucodepleted RBCs, 92% of the 51 units showed haemolysis <0.8% (mean ± 1 SD = 0.4% ± 0.3%) after storage at 2-6°C for 42 days. The total Hb and residual WBC counts were 51.4 ± 6.06 × 10^12/unit (mean ± 1 SD, n = 51) and 0.23 ± 0.19 × 10^9/unit (mean ± 1 SD, n = 51) respectively. The plasma units showed low numbers of contaminating platelet (mean ± 1 SD = 18.5 ± 8.5 × 10^9/l, n = 51), RBC (mean ± 1 SD = 0.03 ± 0.10 × 10^9/l, n = 51) and WBC (mean ± 1 SD = 0.0 ± 0.0 × 10^9/l, n = 51). The plasma volume and FVIII activity were 260.0 ± 28.9 mL (mean ± 1 SD, n = 51) and 78.7 ± 26.1 IU/100 mL (mean ± 1 SD, n = 6) respectively. The plasma volume so produced was significantly (P < 0.001) higher than that prepared by the in-use semi-automated method with Compect G’s blood extractor (Frensenius-Kabi, Bad Homburg, Germany) (mean ± 1 SD = 206 ± 43 mL, n = 266, data extracted from our blood components QC database, July-December 2016). The PFPFTs showed an absolute platelet count of 275.3 ± 41.4 × 10^9/unit (mean ± 1 SD, n = 12) and pH 7.18 ± 0.05 (mean ± 1 SD, n = 12) after 5 days of storage at 20-24°C with continuous agitation. Residual WBC count in the PFPFTs was 0.01 ± 0.00 × 10^9/unit (mean ± 1 SD, n = 12). No bacterial growth was detected in the leucodepleted RBCs and PFPFTs.

Summary/Conclusions: The Reves system provides full automation in blood component separation and the manufactured blood components meet all the quality criteria stipulated by American Association of Blood Banks Standards and Council of Europe Guidelines. More plasma (26.2%) was gained and amenable to use in plasma fractionation when processed by Reves system.

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THE APPLICATION OF AUTOMATIC LEUKOCYTE FILTRATION MONITORS IN BLOOD PREPARATION DEPARTMENT

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Background: Leukocyte filtration can effectively reduce the clinical transfusion reaction. The classic mode of leukocyte filtration is to hang the blood bags in a low-temperature cabinet making the blood flow through the filter by the action of gravity. It is, however, difficult to standardize the manual operations, especially when filtering blood bags in large quantities. Quality of the blood products may also face certain problems, such as the low erythrocyte recovery rate, blood going through the bypass path instead the filter. In 2015, 4 automatic leukocyte filtration monitors were set up in our department, which have been utilized to monitor the whole process of the leukocyte filtration, in order to achieve the standardization and informatization of the filtering operation.

Aims: To discuss the capability of real-time monitoring, data validity and traceability of the equipment, in order to improve the quality of the blood products.

Methods: Blood samples donated between Aug. 1, 2016 and Jun. 12, 2017 were selected, which included 15502 samples in volume of 300 mL and 17570 samples in volume of 400 mL. Certain parameters of the equipment, including the whole blood weight, blood filtration time and leukocyte residual rate, were collected and statistically analyzed. The actual whole-blood collecting weight range and time of filtration process using different-sized blood bags and filters were calculated. Meanwhile, leukocyte count of 20 specimens from blood braids, 10 cm below the filters for both 300 mL and 400 mL-volumed bags were measured by ADAM-RBCC Cell Counting System. Further comparisons were carried out to evaluate the performance of different filters.

Results: For 300 mL-volumed collections, actual whole-blood weight range was 378 ± 21 g, and filtration time ([filters A] was 3′58″ ± 52″. For 400 mL-volumed collections, actual whole-blood weight range was 495 ± 16 g, and filtration time ([filters B] was 9′02″ ± 58″. The pass rate of leukocyte count for filters A and B was 79%(15/20) and 80%(16/20), respectively.

Summary/Conclusions: Automatic leukocyte filtration monitors can in real time record all the data throughout the process, which also standardized the operation and improve the quality of the blood products.

P-168

ASSESSMENT FOR THE EFFECT OF PREPARING CRYOPRECIPITATE USING AUTOMATED BLOOD COMPONENT SEPARATOR

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Background: Preparing cryoprecipitate using manual method was long time consumption and inefficiency.

Aims: Two preparation methods were compared: preparing cryoprecipitate using manual method (i.e. manual method) and preparing cryoprecipitate using automated blood component separator (i.e. instrumental method). Effect of preparing cryoprecipitate with instrumental method was assessed in step of preparation process, time consumption of preparation and quality of cryoprecipitate.

Methods: 48 bags of cryoprecipitate were prepared by manual method in 2013. 48 bags of cryoprecipitate were prepared by instrumental method in 2016. The quality of cryoprecipitate was compared between two groups by statistic methodology. Effect of preparing cryoprecipitate with instrumental method was assessed in step of preparation process, time consumption of preparation and quality of cryoprecipitate.

Results: The levels of factor VIII prepared with manual method and instrumental method respectively were: (101 ± 10.03) IU and (123.5 ± 11.56) IU. The difference of statistical significance in [t = 10.19, P < 0.05]. The levels of fibrinogen prepared with manual method and instrumental method respectively were: (15.87 ± 2.03) mg and (17.52 ± 2.15) mg. The difference of statistical significance in [t = 2.21, P < 0.05]. The levels of factor VIII prepared with manual method and instrumental method respectively were: (260.0 ± 26.1) IU/100 mL (mean ± 1 SD, n = 51) and (266.0 ± 26.1) IU/100 mL (mean ± 1 SD, n = 6) respectively.

Summary/Conclusions: Cryoprecipitate was of better quality prepared by instrumental method than manual method. Compared with manual method, the time consumption was reduced, the more efficiency was improved. Furthermore, the whole preparation process could be computerized.

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sulfobetaine group to the surface bearing OH, while the effect of functional group on platelet function such as platelet aggregation, platelet hypotonic shock response (HSR) and platelet activation (expression of CD62P) showed that the surface bearing OH had good platelet compatibility. Moreover, the surface bearing OH had no significant effect on blood coagulation, and the surface bearing sulfobetaine group showed anticoagulant property, and exhibited an effect in inhibiting blood coagulation.

Summary/Conclusions: Our results emphasized that surface functional groups had significant effects on the adhesion of platelet, platelet function and blood compatibility, and PBT-PHEA had good blood compatibility and no effect on platelet function. It can help to achieve the design of more effective anti-platelet adherent materials for blood filtration applications.
the same amount of DEHP as respective bag type) were sealed with the cordless sea-
ler QSeal Free (CS646, Conroy Medical AB, Upplands Vasby, Sweden) 12 cm from
the bag while containing liquid. Seals were inspected and bags with flawless seals
(seals were determined to be flawless when they were (i) placed at 90° angle in
the centre of the tube, (ii) had melted plastic flaps protruding equally on both sides)
were packed in centrifuge liners in a standardized way, with the bag label facing
the middle of the centrifuge liner and the tube ending facing downwards for maximum
pressure on the sealed end. Padding was used to fill up the additional space in the
centrifuge liner, to support and protect the transfer bag and secure the position of
the tube. Centrifugation was done in centrifuges (MacoSpin, Macopharma) at
4800 x g for 11 min with maximum acceleration and semi-hard brake, mimicking
an ordinary WB separation program with hardest possible g-force. The seals were
inspected after every centrifugation cycle (CC). Any weaknesses in seals, broken seals
or broken bags were registered. Unaffected units were re-centrifuged until broken or
a maximum of 10 CCs.

Results: No leaks were noted for any of the seals, regardless of DEHP content of the
tube. However, leaks were observed in the filled bags, starting at the 8th CC. 27 of
the 35% DEHP units (75%) and 34 of the 32% DEHP units (94%) remained unaf-
fected throughout 10 CCs.

Summary/Conclusions: 100% of the seals made with QSeal Free withstood all cen-
trifuge cycles at maximum speed without showing any signs of weakness or leakage.
The strain the seals were put through is well above what blood bags are normally
exposed to, even though not all seals were exposed to 10 CCs. Therefore, sealing PVC-
tubes in a correct manner with an adequate bag tube sealer does not represent a weak
point in blood bag centrifugation independent of the DEHP content of the tube. Thus,
seals breaking at centrifugation are avoidable. Whether problems with seals breaking in
the centrifuge are a result of less quality of the sealing equipment or poorly executed
sealed bags, a need for better staff training remains to be investigated.

P-176
PRELIMINARY STUDY OF ANAEROBIC PRESERVATION ON SUSPENDED LEUKOCYTE-REDUCED RED BLOOD CELLS

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Background: The damage of RBCs were increased with the prolongation of preser-
vation, including morphological damage, osmotic fragility increasing, hemolysis.
The standard of the United States and the European Union stipulates that hemolysis
rate should be <0.8% in the late erythrocyte preservation. The hemolysis rate of red
blood cells is 0.2-0.4% for 5-6 weeks. In recent years, oxidative stress caused by red
blood cell damage is increasingly concerned about, and anaerobic preservation is
expected to reduce this damage.

Aims: To study the effect of anaerobic preservation on suspended leukocyte-
reduced red blood cells (RBCs).

Methods: Ten bags of suspended leukocyte-reduced red blood cells were collected
and prepared using 200 ml one-time filter blood cell bag. Then, each bag of sus-
pended leukocyte-reduced RBCs was divided into two bags using sterile feeder, and
the anaerobic group completed the aseptic exchange of nitrogen 3 times through the
0.22 μm filter. Both groups of suspended RBCs were stored in 4°C, while the
anaerobic group was placed in a stacking manner. The samples were taken at 0, 7,
14, 21, and 35 days, and the hemolysis rate was measured by erythrocyte osmotic
fragility test (H50%).

Results: The H50% of the anaerobic group and conventional preservation group
showed increasing trends simultaneously, but the anaerobic group was lower in the
same preservation time. There were statistically significant differences between the
two groups for 28 and 35 days (P<0.05).

Summary/Conclusions: The anaerobic preservation can effectively improve
the hemolysis of RBCs caused by oxidative stress injury, and extend the preservation time.

P-177
AN IN VITRO STUDY OF COAGULATION PROPERTIES IN REFRIGERATED WHOLE BLOOD AND RECONSTITUTED
WHOLE BLOOD

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Background: To rescue the patients with large volumes of lost blood [massive trans-
fusion] requires administration of red blood cells (RBCs), plasma, and platelets (PLTs)
or, alternatively, whole blood (WB). However, civilian hospitals now often provide
“transfusion packages” containing these components in a 1:1:1 ratio. The aim of these
packages is to mimic whole blood, and the transfusion packages may consist of
bags in which all the components are mixed or the components may be kept sep-
ately. By the way, “fresh” WB has been observed in military application and in
pediatric cardiac surgery. The maximum time of WB use in military is 24 h of room
temperature storage, and in pediatric cardiac surgery is 48 h of refrigerated storage.
Stimulated by the reports from the military and pediatric cardiac surgery, we wanted
to elucidate the in vitro consequences of the differences in storage age of the coag-
ulation function and to compare with reconstituted WB to those of what could be
regarded as “the golden standard”.

Aims: Fresh whole blood (WB) has been observed in military application and car-
diac surgery and is associated with reduced blood loss. We undertook an in vitro
study of coagulation properties of refrigerated WB stored for 21 days, and compared
with reconstituted whole blood which was an intended red cell:platelet:plasma ratio of
1:1:1.

Methods: Ten WB units were obtained from healthy volunteer donors and stored at
4 °C. Samples were obtained on the day after donation and again on Days 2, 4, 6, 8, 10, 14, and 21. Ten compositions of reconstituted whole blood were prepared with
the same ratio of red cells, platelets and plasma as used in local transfusion packages,
and the storage time of red cells and platelets was varied in a systematic
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STORAGE-RELATED MORPHOLOGICAL CHANGES IN RED BLOOD CELLS

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Background: It is widely accepted that red blood cells (RBC) in storage undergo a progressive morphological transformation from biconcave discocytes to ‘spiky’ echinocytes. The final stage of this transformation, to smaller and denser spheroechinocytes, is irreversible and is linked to a high clearance rate by the liver after transfusion and a decrease in transfusion efficiency. To preserve healthy cells’ membrane properties and minimize hemolysis through storage, cells are stored in SAGM (Saline Adenine Glucose Mannitol), a hypertonic solution. As a consequence of storage in SAGM, swollen cup-shaped RBC called stomatocytes are observed.

Aims: In this study we investigated RBC morphology during routine storage in SAGM and the shape change when stored RBC were returned to plasma.

Methods: The morphology of packed RBC, manufactured using standard procedures, was evaluated by microscopic examination weekly during storage (up to 50 days) for six RBC units. RBC of differing morphology were counted following 2 h equilibration, in either fresh SAGM or ABO compatible donor fresh frozen plasma, at 4°C or room temperature (RT). Diameter and morphology were evaluated for more than 200 RBC for each condition.

Results: In SAGM, a majority of RBC maintained a discocyte or stomatocyte morphology though storage. The number of echinocytes in SAGM remained around 2% on average and below 5% at any time. In plasma, an increasing number of the cells underwent echinocyte transformation, which became more pronounced in SAGM stored at 4°C and RT.

Summary/Conclusions: This in vitro study of coagulation properties demonstrates that refrigerated WB remain normal integrated coagulation function to a minimum of 10 days under standard storage condition. The coagulation properties in refrigerated WB were superior to those in reconstituted WB before Day 10.

P-179

PROTECTIVE EFFECTS OF ANTIOXIDANT COMPONENTS FROM GINKGO BILBOA EXTRACT ON STORED ERYTHROCYTES

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Background: Red cell storage injury is common, and it is a task for blood workers to find safe, efficient and simple techniques to prolong red cell storage time and reduce red cell storage damage. The purpose of this study was to investigate the effect of antioxidant components extracted from Ginkgo biloba leaves on red cell storage.

Aims: To study the effect of antioxidant components of Ginkgo biloba extract on storage of erythrocyte function.

Methods: Twenty donors with 20 red blood cells were randomly divided into two groups: the experimental group and the control group, 20 rats in each group. All the experimental groups were stored in 4°C refrigerator, after 0, 1, 3, 7, 15, 20, 25, 30, 35, 42 d after sampling were detected ATP content, the average volume of red blood cells (MCV), Na+，K+，pH values, and observed red blood cell morphology.

Results: The ATP levels of both groups decreased with the prolongation of storage time, but the degree of ATP reduction and the rate of ATP in the antioxidant intervention group were significantly lower than those in the control group (P < 0.01). The normal rate of MCV in the antioxidant intervention group was significantly higher than that in the control group (P < 0.05). The levels of Na+ and pH in the antioxidant intervention group were lower than those in the control group (P < 0.05), while the K+ was gradually increased with the prolongation of storage time.05). With the prolongation of the control group, erythrocytes gradually lost normal biconvex disc shape, antioxidant intervention group can better maintain the normal form of red blood cells.

Summary/Conclusions: The antioxidant components of Ginkgo biloba extract can protect red blood cells, reduce the damage factors, keep the red blood cell morphology and function, and reduce the red blood cell destruction.

P-180

EFFECTS OF UBIQUITIN ON BIOLOGICAL CHARACTER OF MELANOMA B16 CELLS

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Background: Ubiquitin is a small heat-stable and highly conserved 76 amino acid protein in all eukaryotic cells, our previous studies found that the content of ubiquitin increases significantly during red blood cell storage. While peritransfer blood transfusion especially storage blood was associated with higher rates of tumor recurrence and metastasis, and the mechanism behind remains controversial.

Aims: To investigate the effects of extracellular ubiquitin on the proliferation, invasion and early apoptosis of mouse melanoma B16 cells.

Methods: The effects of different concentrations of extracellular ubiquitin (200 ng/ml, 400 ng/ml and 800 ng/ml) on the proliferation of melanoma in mice were detected by CCK8 assay. The invasive ability of mouse melanoma cells treated by different concentrations of extracellular ubiquitin (200 ng/ml, 400 ng/ml and 800 ng/ml) was detected by Transwell. The effect of extracellular ubiquitin on early apoptosis of melanoma cells was verified by flow cytometry.

Results: 1) The results of cell proliferation experiment showed that the absorbance values (OD450) at 96 h of extracellular ubiquitin intervention groups (200 ng/ml, 400 ng/ml and 800 ng/ml) compared with the control group (0.29 ± 0.009), were [0.33 ± 0.007]，[0.43 ± 0.008]，[P < 0.001] and [0.40 ± 0.007]，[P < 0.001] respectively. 2) The results of invasion test illustrated that the relative numbers of cells invading through the basement membrane in extracellular ubiquitin intervention groups (200 ng/ml, 400 ng/ml and 800 ng/ml) were (182 ± 12)，(332 ± 19)，(P < 0.01) and (271 ± 30)，(P < 0.01) respectively, compared with the control group (165 ± 19.3). Flow cytometry analysis found that the early apoptosis rate of melanoma cells in the 400 ng/ml ubiquitin intervention group (13.97 ± 1.63%) was higher than that of control group (22.83 ± 2.26%), P < 0.01.

Summary/Conclusions: Extracellular ubiquitin can promote the proliferation and invasion of melanoma cells in mice, and inhibit the early apoptosis. Furthermore, these effects are obvious in 400 ng/ml concentration of ubiquitin.
Background: Manually prepared platelets were stored at 4°C and 22°C to evaluate their stability and compare the platelet counts, morphological changes, platelet metabolisms in platelets stored at 4°C, attempting to provide experimental evidences to storage red blood cells (RBC) effectively in vitro to ensure transfusion. The cryopreservation of RBC is one method of storage RBC. Currently high concentration of glycerol are used as the main cryoprotectants for frozen RBC. High concentration of glycerol has high osmotic pressure and would be influence the stability of RBC. For the glycerol cells, cells need to regulate intracellular and extracellular osmotic pressure and maintain normal form. Ectoine is one of compatible solutes which could regulate osmotic pressure in the halophilic bacteria and halotolerant bacteria. According to other studies, we speculate ectoine could be one of superb cryoprotectants in RBC storage.

Aims: To investigate the effect of osmotic adjustment of RBC with ectoine and to investigate the quality of RBC after thawing.

Methods: RBC kinetics in the isotonic ectoine solution, in the isotonic sodium lactate solution, in the normal saline solution, in ultrapure water and in the isotonic glycerol solution were determined. We ascertained the procedure of glycerolization before freezing RBC and the procedure of deglycerolization after RBC thawing. 1.5%, 1.0% and 4.5% (w/v) ectoine with 57% (w/v) glycerol were set as the experimental groups, while the commercial compound glycerol solution was set as the control group. The recovery rate, the deformability, the osmotic fragility, the content of adenosine triphosphate (ATP), the activity of fructose-6-phosphate kinase (PFK), the activity of pyruvate kinase (PK), and the activity of lactate dehydrogenase (LDH) were determined for evaluating the quality of frozen RBC.

Results: The RBC kinetics in the isotonic ectoine solution, in the normal saline solution, and in the isotonic sodium lactate solution are similar; the RBC kinetics in ultrapure water and in the isotonic glycerol solution are similar. 3% ectoine with glycerol cryopreserved RBC was better than the commercial compound glycerol solution in the quality of frozen RBC. 

Summary/Conclusions: Ectoine could be one of superb cryoprotectants in RBC storage, and the RBC kinetics in the isotonic ectoine solution were better than those of RBC stored at 4°C for 5 days.
P-185
MYELOPEROXIDASE LEVEL INCREASES DURING STORAGE EVEN IN LEUKODEPLETED PLATELET CONCENTRATES
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Background: The contaminant leukocytes in PC is an important factor implicated in platelet storage lesion during storage. Leukodepletion is a method to reduce contaminant leukocytes. Myeloperoxidase (MPO) is an enzyme produced by polymorphonuclear cells that have the potential to change structure and function of platelets during storage.

Aims: To analyze the myeloperoxidase level in leukodepleted PC during storage.

Methods: This study was conducted at the Blood Transfusion Services Unit, Dr. Sardjito Hospital, Yogyakarta, Indonesia. Myeloperoxidase level was measured using ELISA method from stored leukodepleted PCs (≤72 h) compared to non-leukodepleted PCs as control. The difference in each group was analyzed using ANOVA and post hoc test with significance level of P ≤ 0.05.

Results: There were 31 PCs with ≤72 h and 33 PCs with >72 h of storage. The median of MPO level in >72 h was higher than in ≤72 h stored leukodepleted PCs (11.11 ± 3.97 ng/mL vs. 10.69 ± 3.16 ng/mL). In >72 h stored PC group, the median of MPO level was significantly lower in leukodepleted than in non-leukodepleted PCs (11.11 ± 3.97 ng/mL vs. 15.58 ± 7.82 ng/mL; P = 0.001).

Summary/Conclusions: The myeloperoxidase level was revealed higher in >72 h than in ≤72 h stored leukodepleted PCs and significantly lower in leukodepleted than in non-leukodepleted PCs.

P-186
STUDY ON PLATELET STORAGE DAMAGE AND PARTICLE RELEASE IN Apheresis PLATELETS
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Background: With the increasing application of platelet, platelet storage lesion is caused more and more attention. Researches had shown that platelet storage lesion was significantly, platelet activation increased and platelet microparticles releasing also increased with the prolongation of storage time. Platelet microparticles can transfer information between cells and can improve the effect of tumor growth, inflammation and promoting tissue regeneration process. It is an urgent problem to study the platelet storage, the properties and release of platelets microparticles, and how to reduce platelet storage damage and the release or removal of particulates.

Aims: To study platelet storage lesion and the release of platelet microparticles with the prolongation of platelet preservation time, and to avoid the bad effects of clinical transfusion.

Methods: The platelets were made by plateleapheresis by Amicus donated by healthy volunteers from 6 young men, then suspended for 1, 3, 5 and 7 day. The platelet count was tested by Blood Cell Counter; CD62P expressed on platelet surface was detected by flow cytometry; Platelet aggregation test was by CLS-100 platelet aggregation analyzer. Platelet microparticle concentration in single platelet supernat was measured with human platelet microparticle ELISA assay reagent.

Results: 1. There was no significant difference in different preservation time of platelet count (P > 0.05); but with the preservation of the lactic acid concentration increased gradually; the expression of CD62P on platelet surface increased significantly, suggesting that platelet activation increased; Platelet aggregation decreased significantly, suggesting that platelet storage lesion significantly with prolongation of storage period.

2. The results showed that the concentration of platelet microparticles gradually increased with the prolongation of storage time, and the platelet particles preserved for 7 days were significantly higher than those preserved for 1 days (P < 0.05).

Summary/Conclusions: With the prolongation of storage time, the platelet activation increased, the damage became obvious, and the release of platelet microparticles increased.

P-187
MICROPARTICLES IN STORED APHERESIS PLATELETS
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Background: Microparticle (MP) could appear during the process of preparation and storage of blood products. Moreover, the formation of microparticles has been well illustrated in whole blood, but not in stored apheresis platelet.

Aims: The aim of this study is to compare the levels of platelet (PLT)-derived (PDMP), red blood cell-derived (RDMP), leukocyte-derived (LDMP), Monocyte-derived (MDMP) and endothelial cell-derived (EDMP) in circulating blood and stored apheresis platelet through flow cytometry (FCM).

Methods: The apheresis platelets (8 with and 8 without leukofiltration) were obtained from 16 healthy blood donors, and stored in 22 ± 2°C for 5 days. Platelet-poor plasma (PPP) was generated by centrifugation of the circulating blood (from the donor) and the platelet products respectively at 2500 g for 15 min. The PPP was then labeled with CD41a (PDMP), CD13 (RDMP), CD42 (LDMP), CD14 (MDMP) and CD144 (EDMP), which were detected on day 0, day 1, day 3 and day 5 of storage by FCM.

Results: There were significantly higher percentages of TMP (total microparticles) and PDMP (13.45% ± 1.73% vs. 7.39% ± 1.41%; P < 0.05, and 59.29% ± 6.46% vs. 20.50% ± 6.81%; P < 0.001, respectively), higher numbers of TMP, PDM and EDP (4964 ± 917.7/µl vs. 2794 ± 421.5/µl; P < 0.05, 4517 ± 936.6/µl vs. 879.6 ± 552.0/µl; P < 0.001, and 39.57 ± 6.2/µl vs. 22.91 ± 7.87/µl; P < 0.05, respectively) in fresh PLTs (day 0) than those in circulating blood. However, lower percentages of RDMP, LDMP, and EDPMP (9.42% ± 0.83% vs. 22.38% ± 2.60%; P < 0.001, 2.79 ± 0.51 vs. 16.16% ± 2.55%; P < 0.0001, and 1.69% ± 0.35% vs. 15.94% ± 2.66%; P < 0.0001, respectively) and lower counts of LDMMP and 1MDMP (2.55% ± 0.0001 vs. 879.6 ± 421.5/µl vs. 0.001, 79.01 ± 46.6/µl vs. 587.3 ± 99.0/µl; P < 0.001, respectively) were detected in fresh PLTs than those in circulating blood. The number of MP, PDM and RDM were respectively increased by 2-fold, 3-fold and 1.9-fold, but the numbers of MDMP, LDMP and EDPMP were not obviously increased after 5 days of storage (compared with the levels in day 1, respectively). Additionally, leukofiltration had no significant effects on the MP formation in apheresis platelets.

Summary/Conclusions: The MP formation was different between the apheresis platelet and circulating blood, much higher levels of PDM and lower levels of RDMP, LDMP and MDMP were detected in PLTs. The TMP, RMP and RDMMP accumulated, but the other types of MP were not accumulated in the platelet concentrates during the 5 days of storage.

P-188
STUDY ON LONG TERM CRYOPRESERVATION ON PLATELETS
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Background: In this project, the quantity and quality of platelets after the low temperature condition were monitored continuously.

Aims: To discuss the most reasonable conditions of low temperature preservation and preservation of platelets.

Methods: 1. Preparation of fresh platelet rich plasma (FPRP) from whole blood. 2. Each FPRP will be divided into 19 parts, of which 9 cases preserved in the −80 low temperature refrigerator for 2–18 months. 9 pieces were kept in liquid nitrogen for 2–18 months. 1 samples were detected the quantity and activity of the platelet used as control. 3. During the storage period, each sample was removed from the −80 low temperature refrigerator and liquid nitrogen every 2 months. The test data is compared with the control group and the same conditions the other storage time point sample test data were analyzed, extend the observation of different temperature conditions with the preservation time of platelet. The reasonable period of time clearly different low temperature preservation of platelets.

Results: 1. At low temperature for 2 months, there were some changes in platelet count in FPRP compared with fresh FPRP. 2. Two cryopreservation methods were used to preserve the platelets in 2–18 months. There was no significant difference between the two groups in the same period. Summary/Conclusions: Liquid nitrogen and low temperature refrigerator can be used for long-term preservation of platelets. During the period of 2–18 months, there was no obvious difference between the two methods.
P-189  THE EXPERIMENTAL RESEARCHES OF THE LYOPHILIZING PLATELETS
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Background: The platelets were used extensively in clinical practice, to improve platelets preservation time and quality has become one of the hot research of transfusion medicine.
Aims: To study the basic protective and rehydration solution on the suitable glycerol content of the lyophilizing platelets, to investigate the effects of various kinds of saccharides and their different concentrations on the viability of the lyophilizing platelets. To understand the changes in the function and activity of the platelets, the maximum aggregating rates and the expressions of CD61, CD62p and PAC-1 of the platelets before and after lyophilizing was detected.
Methods: According to the various kinds of saccharides added into the platelets lyophilizing basic protectant, the platelets lyophilizing basic protectant was divided into 9 groups. The expressions of CD61, CD62p and PAC-1 of the platelets before lyophilized and rehydrated were analyzed by flow cytometry (FCM), the maximum aggregating rates of the no-induced platelets and induced platelets were detected by the platelet aggregation instrument.
Results: Particularly 7% glycerol plasma protectant for preservation of the platelets lyophilizing agent and water for the rehydrating solution of the lyophilizing platelets, the recovery of the platelets after rehydration was 85.5 ± 11.7%. The recovery rate of 0.15 g/mL trehalose and 0.10 g/mL sucrose were much higher than the others which were (94.04 ± 6.03)% and (95.35 ± 5.15)%. The maximum aggregation rates of the platelets before lyophilizing and rehydrating were (34.10 ± 33.14)% and (22.10 ± 23.25)% respectively. The results of CD61 expression of the platelets before lyophilizing and rehydrating were (41.17 ± 13.55)% and (48.64 ± 13.24)%. The results of CD62p expression of the platelets before lyophilizing and rehydrating were (17.34 ± 6.47)°C and (0.79 ± 4.48)% respectively. The results of PAC-1 expression of the platelets before lyophilizing and rehydrating were (4.92 ± 6.33)% and (4.22 ± 4.64)% respectively.
Summary/Conclusions: The 7% glycerol plasma protectant for preservation of the platelets lyophilizing agent and water for the rehydrating solution of the lyophilizing platelets was the most appropriate. Comparing the recovery rate of the lyophilizing platelets, the results show that 0.15 g/mL trehalose, 0.10 g/mL sucrose and 0.16 g/mL mixed saccharides for the additive of the lyophilizing platelets are the more appropriate single saccharide and mixed saccharides. The maximum aggregation rate of the platelets before lyophilizing has showed no significant difference as compared with it of the rehydrated platelets. The lyophilizing platelets still has certain aggregation activity, that showed its has a certain ability of survival. Although the expression of CD61, CD62p and PAC-1 were differences, but the differences of its were no statistical significance. The researches provided a theoretical basis for the establishment of the platelets lyophilizing method.

P-190  THE REMOVAL OF DMSO FROM FROZEN PLATELET CONCENTRATES BY DIALYSIS WASHING
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Background: In addition to freezing injury, it has been reported that some damage to platelets may result from the cell packing that occurs during removal of the cryoprotectant.
Aims: In this research, we try to study the effect of the removal of DMSO from frozen platelet concentrates by dialysis washing on platelet function.
Methods: This study examined DMSO removal by fluid exchange across hollow-fiber (HF) filters as an alternative to centrifugation. 60 copies of fresh platelet concentrates were randomly divided into 2 groups (Group A: dialysis group, Group B: centrifugation group). The frozen platelet concentrates were stored for 1 week, 3 months and 6 months respectively. Then the following parameters of platelets were detected: Platelet counting, MPV, pH, CD62P expression rate, apoptosis, hypotonic shock response test (HSR), platelet aggregation function, platelet recovery (PPR), and DMSO residual.
Results: Platelet counting in Group A is significantly higher than Group B, and the DMSO residual in Group A is significantly lower than Group B in the storage of 1 week, 3 months and 6 months respectively. There are no significant differences between other indexes of frozen platelet concentrates between the two groups during the storage at 1 week, 3 months and 6 months.
Summary/Conclusions: Platelet quality was comparable after washing by either technique, but dialysis washing does remove cryoprotectant more rapidly than does centrifugation.

P-191  CORRECTIVE EFFECTS OF 4°C STORAGE ON IN VITRO HEMORRHAGIC MODE OF PLATELETS
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Background: Few studies have investigated the low-temperature storage of platelets.
Aims: The corrective effects of storage at 4°C and agitation at 22°C on the in vitro hemorrhagic mode of platelets were compared to provide an experimental basis for the preservation of platelets for clinical applications.
Methods: Manual collection platelet 200 ml (10 doses) is divided into 2 × 100 ml storage at 4°C and 22°C respectively. A total of 5 × 200 ml such a bag (200 ml) of PLT was divided into two sub-bags each with a volume of approximately 100 mL—respectively stored at 4°C and at 22°C. A model of in vitro massive blood loss was established with the in vitro hemolysis method—diluting blood with normal saline (NS) at a ratio of 9:1 (NS: whole blood). The corrective effects of suspended erythrocytes, fresh frozen plasma, and platelets were prepared on the ratio of 1:1:1 respectively stored at 4°C and at 22°C were evaluated for in vitro hemorrhagic by using Thromboelastography (TEG) test index and routine blood marker levels.
Results: Platelets stored at 4°C and those agitated at 22°C for 1, 3, and 5 days were corrected using the in vitro hemorrhagic model prepared using the same blood samples. Platelet counts (×10⁹/L) were corrected from 20–27 to 127–161vs 128–160, respectively (P > 0.05), and the TEG-MA (min) were corrected from 12.7–14.5 to 45–51 vs 47–50, and TEG-R values were corrected from 27.7–9.9 to 4.4–4.3 vs 4.5–4.7, respectively (P > 0.05). For platelets stored at 4°C for 7–14 days, their platelet counts (×10⁹/L) were corrected from 18–27 to 162–161, TEG-MA (mm) were corrected from 8.8–14.5 to 46–43, TEG-R (min) were corrected from 24–13 to 5.5–5.2 (P < 0.05).
Summary/Conclusions: Correction was performed using the hemorrhagic mode on the suspended erythrocytes, fresh frozen plasma, and platelets stored at 4°C or those agitated at 22°C. The platelet counts, TEG-R, and TEG-MA values were corrected, thus supporting the claim that platelets stored at 4°C for 10–14 days can achieve a good coagulation effect.

P-192  CORRECTIVE EFFECTS OF 4°C STORAGE ON IN VITRO THROMBOCYTOPENIC MODE OF PLATELETS
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Background: Few studies have investigated the low-temperature storage of platelets.
Aims: The corrective effects of storage at 4°C and agitation at 22°C on the in vitro thrombocytopenic mode of platelets were compared in order to provide an experimental basis for the preservation of platelets for clinical applications.
Methods: Using thromboelastography and platelet count, the in vitro corrective effects of thrombocytopenic platelets were evaluated for those stored at 4°C and those agitated at 22°C for various durations.
Results: Platelets stored at 4°C and those agitated at 22°C for 1, 3, and 5 days were corrected using thrombocytopenic platelets prepared using the same blood samples. The platelet counts were corrected from 10–30 × 10⁹/l to >100 × 10⁹/l. Platelets that had been stored at 4°C for 7–14 days achieved similar correction values. Platelets that had been stored at 4°C for 10–14 days and those agitated at 22°C for 5 days were corrected using thrombocytopenic platelets. Their corrected thromboelastography (TEG)-MA values were within the normal range, and thus the corrective effects were achieved.
P-193
EXPERIMENTAL STUDY OF THAWED CRYOPRECIPITATE AT DIFFERENT TEMPERATURES AND TIME ON FACTOR VIII AND FIBRINOGEN
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Background: Cryoprecipitate (Cryo) stored at 20–24°C for up to 6 h after thawing is a common practice in many US hospitals. However, in China, Cryo were thawed and stored for 24 h at 2–6°C.

Aims: To examine the level of activity of coagulant factor (F) VIII and fibrinogen (Fib) in thawed Cryo at different temperatures.

Methods: Cryo were randomly selected, thawed and stored in separate refrigerators at (±4°C or (±2°C). The activity level of FVIII and Fib were monitored and measured in each Cryo sample at baseline, 6 and 24 h.

Results: The activity level of factors showed decline after 6 and 24 h in storage. The activity level of FVIII stored at (±4°C) was significantly lower than that stored at (±2°C). The activity level of Fib stored at (±4°C) was a little lower than that stored at (±2°C), which is relatively more stable than FVIII.

Summary/Conclusions: The changes in activity level for FVIII and Fib in Cryo are comparable at different temperatures. However, decline was most significant when storage time increased. Thus, the thawed Cryo should be stored at a temperature of (±2°C) and be transfused as easily as possible.

P-194
EVALUATION OF ADAMTS13 ACTIVITY IN THAWED PLASMA STORED AT DIFFERENT CONDITIONS
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Background: The von Willebrand factor (VWF)-cleaving protease, ADAMTS13, is often deficient in cases of thrombotic thrombocytopenic purpura (TTP). Plasma exchange is the primary treatment of TTP to help restore ADAMTS13 activity. How-ever, the stability of ADAMTS13 in thawed plasma stored at different temperature has not been determined.

Aims: The study evaluated ADAMTS13 activity in thawed plasma stored at different temperature for a period of time, aiming at providing information for transfusion services.

Methods: The study included 20 fresh-frozen plasma (FFP) units obtained from healthy donors. After thawed at 37°C for 5 days, the TEG-MA values showed that corrective effects were achieved, thus supporting the claim that platelets stored at 4°C for 10–14 days could achieve good coagulation effects.

Results: The activity level of factors showed decline after 6 and 24 h in storage. The activity level of FVIII stored at (±4°C) was significantly lower than that stored at (±2°C). The activity level of Fib stored at (±4°C) was a little lower than that stored at (±2°C), which is relatively more stable than FVIII.

Summary/Conclusions: The changes in activity level for FVIII and Fib in Cryo are comparable at different temperatures. However, decline was most significant when storage time increased. Thus, the thawed Cryo should be stored at a temperature of (±2°C) and be transfused as easily as possible.

P-195
Abstract has been withdrawn

P-196
THE CHANGES OF NEUTROPHIL FUNCTION DURING THE PRESERVATION OF NEUTROPHILIC GRANULOCYTES
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Background: The statistical data in recent 10 years showed that clinical albuginea infusion has reached more than 120,000 units and up to 6,000 patients have been treated or cured. It has become an important means of our city to cure ineffective bone marrow severely damaged tumor radiotherapy and chemotherapy, and joint anti-infection.

Aims: To investigate the effect of the preservation status of platelet-rich tunica albuginea on neutrophil (PMN) function over time in 24 h.

Methods: Randomly selected 10 bags of 400 ml healthy adult blood collected within 6 h to separate the platelet-rich tunica albuginea. Each bag of tunica albuginea (40–60 ml) was divided into three groups on average according to the collection time 6 h, 12 h, 18 h group, and placed in a 22°C incubator. PMN was sorted by flow cytometry and the functions of phagocytosis, secretion of reactive oxygen and apoptosis were measured.

Results: (1) The phagocytic function: There was no significant difference when 6 h group and 12 h group were compared. 6 h, 12 h and 18 h group had significant differences. (2) Reactive oxygen: there was no significant difference of 6 h group, 12 h group, 18 h group when each two groups were compared. (3) Apoptosis: apoptosis (apoptosis and necrosis) was not significant difference when 12 h group and 6 h group were compared. There was no significant difference when 18 h group and 12 h group were compared as well. There was significant difference when 6 h group and 18 h group were compared (P < 0.05).

Summary/Conclusions: The phagocytosis and apoptosis of neutrophils begin to change at the beginning of 18 h, and leukocyte collected after 12 h should be transfused as soon as possible.

P-197
Abstract has been withdrawn

P-198
THE METABOLISM EVALUATION OF BLOOD QUALITY AFTER MARINE STORAGE AND TRANSPORTATION
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Background: Glycolysis is the only energetic metabolic pathway for mature erythrocytes to obtain adenosine triphosphate (ATP). Generally, the current methods used to measure RBCs glycolysis are not in living state in real-time, or are destructive to cells or require radioactivity. XF technology can be applied to different types of cells, in which the red blood cells are suspended and the cell shape and size are different from other cells. An extracellular flux (XF) methodology has been particularly advantageous, so application of the XF technology in erythrocytes and exploitation of the assay conditions are necessary.

Aims: To evaluate the quality of blood after marine storage and transportation, a quantitative energy metabolism platform supported by extracellular flux (XF) technique is established to determine the glycolysis level of red blood cells. The “functional dose”, as a valuable supplement, is therefore involved into the quality evaluation of red blood cells after marine storage and transportation.

Methods: The glycolysis of erythrocytes was determined by XF methodology. The concentrations of glucose and 2-deoxyglucose (2-DG) were optimized to when the extracellular acidification rate (ECAR) of erythrocyte glycolysis was detected. Red blood cells suspensions were sailing for 20 days in the Gulf of Bohai or the Pacific Ocean. The level of glycolysis, ATP contents and free hemoglobin of red blood cells...
were detected before and after marine navigation. Red blood cells suspensions stored at 4°C in blood bank on land were served as control.

Results: The results showed that 40 mM glucose and 400 mM 2-DG were the most suitable concentrations for erythrocyte ECAR assay by XF technique. And the evaluating indicators of blood quality and energy metabolism of red blood cells were detected in twice marine storage and transportation. The blood samples sailing in the Gulf of Bohai have no change significantly, indicating that the sample is well preserved. The energy indicators of the blood samples in Pacific Ocean navigation decreased significantly, and it is recommended that the samples be discarded.

Summary/Conclusions: For the first time, XF technique is applied for the measurement of erythrocyte glycolysis and enables high-throughput and multi-indicator assessment of viable cells becomes possible. The energy metabolism of erythrocyte should be recommended as an important indicator in the evaluating system of blood after marine storage and transportation.

P-199
EFFECT OF TRANSPORTATION ON THE STORAGE OF RED BLOOD CELLS
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Background: Red blood cells are inevitably subjected to vibration during transportation, especially the vibration and acceleration will further aggravate biochemically and functionally change caused by processing and storage. Numerous studies have focused on the storage injury of red blood cells, however, there is less research and attention on vibration factors in transportation. And the present study of transportation vibration has no systematic study on the changes of erythrocyte mass with the storage time extending after vibration, namely the study on storage damage of red blood cells by vibration.

Aims: The discussion on effects of vibration on free hemoglobin (FHB), hemolysis ratio, LDH, K+ concentration of red blood cells in different storage time.

Methods: Choosing 20 bags (2 U/bag) red blood cells (RBC) stored for 7 days (Control group and Experimental group (10 bags per group) as the research object, the Control group were stored with conventional methods at 4°C, the combination of wheeled vehicle (three direction vibration of horizontal, longitudinal, vertical) was selected to simulated RBC transportation using electromagnetic vibration test system. The RBC samples were prepared on vibration 0 h, 3 h, storage of 14 days, 21 days, 28 days, 35 days to detect and analyze FHB, hemolysis ratio, LDH, K+ concentration of samples.

Results: The FHB, hemolysis ratio, LDH, K+ concentration was significantly increased after vibration (P < 0.05), and FHB, hemolysis ratio, LDH presented a greater increasing trend than Control group with the extending of storage time (P < 0.05), but there was no significant variation of K+ concentration in different storage time.

Summary/Conclusions: The FHb, hemolysis ratio, LDH, K+ concentration was significantly increased after vibration storage of 4 days, there was no significant difference of K+ concentrations between 4.5 h, 6 h after vibration with the exposure duration of vibration.

Blood Components

P-201
Abstract has been withdrawn

P-202
THE RELATIONSHIP OF POST-TRANSLATIONAL MODIFICATION OF HEMOGLOBIN AND HYPOXIC ADAPTATION IN TIBETAN POPULATION
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Background: It was reported that a series of physiological changes will occur in the Han population migrated to Tibetan Plateau. For instance, there are significant enhancement of hemoglobin (Hb) and hematocrit (Hct) in Han migrants ascends to Tibetan Plateau, hypoxia played an important role in this process. However, this symptoms seldom happens in native Tibetan population. Does red blood cells (RBCs) of Tibetan have another way to adapt hypoxic circumstance? To clarify the oxygen delivering capacity differences between Han and Tibetan population, we evaluate the RBCs parameters changes after Han immigrated into Tibetan Plateau (>1 years), and the oxygen-carrying ability difference between Han and Tibetan population.

Aims: To illustrate the mechanism of hematology changes of Tibetan population in adapting hypoxic environment. And our data can provide basic information to support blood component processing and blood storage in Tibetan Plateau.

Methods: Blood samples were collected from Tibet Autonomous Region blood center and Chengdu blood center according to standard procedures. Samples were divided to three group according to donors information: (1) native Tibetan group (8 male, 1 female), (2) Han migrants group (7 male, 1 female), (3) lowland Han group (8 male, 3 female), and their ages ranged from 19-50. The information of weight and height of the donors was not supplied by the blood centers. The 2,3-DPG concentration, RBCs affinity to oxygen (PO2 at 50% saturation of hemoglobin, P50), and MALDI-TOF MS were detected.

Results: Compared to Han migrants, RBCs of native Tibetan population have higher affinity to oxygen (30.63 ± 1.60 vs 24.81 ± 0.74 mmHg, P < 0.05), even the 2,3-DPG concentration have no significant difference in those two group (2.93 ± 0.8 mmol/l vs. 2.39 ± 0.95 mmol/l). And RBCs affinity to oxygen do not have significant difference between native Tibetan and lowland Han population (24.81 ± 0.74 vs 23.95 ± 1.79 mmHg). Combining with MALDI-TOF MS data, we found that the molecular weight of partial hemoglobin β unit was increased (from 15848 to 16160) in native Tibetan. This phenomenon was common in native Tibetan population, but seldom found in Han migrants.

Summary/Conclusions: Combining with MALDI-TOF MS data, we found that there are some changes in hemoglobin of native Tibetan. Considering this phenomenon was common in native Tibetan population, it suggest that it is a kind of post-translational modification in hemoglobin. And this modification seems to be associated with hemoglobin affinity to oxygen.

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Background: Red cell storage lesion is a known phenomenon that represents a challenge to blood banks striving to provide maximum safety and therapeutic effect of blood components. In vitro hemolysis is a key parameter measured to analyze the quality of the chain of production, and the effect the storage lesion has over red cell concentrates. Visual evaluation of hemolysis can be defective, and it has been reported that using blood bag segments could lead to incorrect readings, thus putting a stress to Quality Control and Quality Assurance analysis. The AABBB and the Council of Europe have defined their standards of percent hemolysis for red cell concentrates as 1% (AABB) and 0.8% (CoE).

Aims: The study aimed to analyze the behavior of red cell hemolysis during storage, comparing two blood bag manufacturers, and also to further test the fiducial of blood bag segments with respect of the bag, after careful mixing. The evolution of hemolysis during storage and up to expiration date was also observed.

Methods: 138 red cell concentrates were tested, 70 produced with Terumo-Optisol, 68 with JMS-SAGM. They were distributed into 5 groups, by day of storage: 1-10, 11-20, 21-30, 31-40, and an expiration date group of 41-42 days with 27 bags each group (29 for 42 days). Each bag’s segment was uniformly stripped and mixed with the bag, and it was immediately sealed with heat, with the middle third segment transferred to an EDTA tube, and centrifuged for 10 min at 3500 rpm. A second sample from the same segment was used to measure hemoglobin and hematocrit with a CellDyn 1800 counter. A paired sample was obtained from the center of the bag, and it was treated the same way. Free hemoglobin was measured with the HemoCue PlasmaLow Hb photometer.

Statistical analysis included the Wilcoxon rank-test to compare samples between segments and bags, and paired t-Student test to compare manufacturers. Also, statistical description included means and standard deviations analysis.

Results: Hemolysis measured from the segments did not reflect the hemolysis measured from the bags (W = 118, Z = -9.8617, P-value is 0, significance at P ≤ 0.001), and actually overestimated it. Means from first subgroups were consistently double measured from the segments than from the bags. For the subgroup at expiration date, means were 0.79 (segments) and 0.54 (bags); segments mean was almost at the Council of Europe standard limit for hemolysis in Quality Control. Segments did faithfully reflect other components parameters, like hematocrit and hemoglobin content.

Progression of hemolysis was observed, as expected from the nature of the storage lesion. However, the peaks for hemolysis in both segments and bags was the group of 21–30 days, which saw a 75% increase from hemolysis of the previous group, and stabilized from day 30 to expiration (day 42).

Summary/Conclusions: Red cell concentrates bag segments are not reliable a source of hemolysis measurement, even if they are thoroughly and uniformly stripped and mixed. Quality control of hemolysis to these concentrates should avoid using them, since they overestimate it. Hemoglobin and hematocrit measurement did not present this phenomena. The question could be open to determine if it could be other quality control parameters that could experience the same situation. There was no difference between the two manufacturers analyzed.

Methods: Add DMSO 100% and 75% solution to ready-to-freeze platelets respectively until DMSO solution percentage stands at 1%; use different methods to resuscitate platelets and compare the results.

Results: DMSO concentration, speed of DMSO injection and processing conditions all contribute to platelets quality. When temperature remains 38°C, 75% DMSO solution yields highest resuscitating rate. The results yielded under all conditions in the process show differences that demonstrate statistical significance. Floccules formed in DMSO 100% and 75% solution during the thawing process also show difference that demonstrates statistical significance.

Summary/Conclusions: DMSO 75% solution is more effective for effective preparation and gathering of frozen platelets.
B decreased 7 percent compared with Group A. Group D decreased 11 percent compared with Group A. However, the difference between Group A and Group D was statistically significant ($P<0.05$). 2. Fibrinogen contents (FbgC): Group A: $2.287 \pm 0.338$, Group B: $1.968 \pm 0.296$, Group C: $2.122 \pm 0.331$, Group D: $2.122 \pm 0.331$. FbgC variations between groups: Group C have no significant difference with Group A, Group B decreased 14 percent compared with Group A, Group D increased 8 percent compared with Group B, the difference between Group A an Group B was statistically significant ($P<0.05$).

Summary/Conclusions: Through the study, we can find out that the FFP were still stratified the general clinical needs though partial clotting factor activity had lost after LR and GI, so for the patients who have blood transfusion related adverse reactions we may have better choices: The treatment of GI may have positive effects in the replacement therapy of FbgC, while After GI FFP will be less effective, FFP will be less effective in the replacement therapy of intrinsic coagulation factors, after LR+GI especially after LR, FFP will be more effective in the replacement therapy of extrinsic coagulation factors. However, there is still a need for a larger sample and multicenter randomized controlled trial to confirm whether clinical popularization is available.

Plasma Products

P-209  
CIRCULATING CONCENTRATIONS OF EOTAXIN AND GDF11 IN CHINESE BLOOD DONORS  
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Background: Eotaxin (also known as C-C motif ligand 11, CCL11) is regarded as a potential pro-ageing factor which negatively regulates neurogenesis and cognitive function, and has been found age-related increase in the plasma of mice. Growth differentiation factor 11 (GDF11), a promising rejuvenating factor, can reverse age-related diseases, such as age-related cardiac hypertrophy, impairments in cognitive function, and so on. Furthermore, it was demonstrated that GDF11 in mice plasma decreased with age. These studies suggested a new strategy in the treatment of age-related diseases, where blood plasma from young donors could be used as an eotaxin-poor and GDF11-rich source to reverse age-related disorders. However, the concentration of eotaxin and GDF11 in blood donors has not yet been analysed.

Aims: To evaluate the concentrations of eotaxin and GDF11 in the plasma of Chinese blood donors.

Methods: In all, 476 healthy volunteers were enrolled from qualified blood donors aged 18 y–56 y at Jintang Plasmapheresis Center and Meishan Blood Center. Each of the plasma samples was divided into aliquots, and then they were stored at –70°C until analysis. The concentrations of eotaxin and GDF11 were determined by using R&D Human CCL11/Eotaxin DuoSet ELISA and Human GDF-11/BMP-11 DuoSet ELISA, respectively. ELISAs were carried out according to the vendor’s instructions. Briefly, all the plasma samples were tested in duplicates. After 2 h incubation in eotaxin or GDF11 capture antibody-coated plates, streptavidin-conjugated horseradish peroxidase was added. After further washing, tetramethylbenzidine was introduced. Finally, the optical density was measured at 450 nm using a spectrophotometer.

Results: The average age of the volunteers was 44.45 ± 9 y (male, 44.16 ± 10.06 y, n = 181; female, 44.67 ± 8.25 y, n = 295; $P>0.05$), and the samples were arbitrarily divided into the following four age categories: <30 y (18 y–29 y, n = 60), 30 y–39 y (n = 67), 40 y–49 y (n = 189) and ≥50 (50 y–56 y, n = 160). Mean eotaxin and GDF11 levels were 118.5 ± 57.61 pg/mL and 21.54 ± 17.62 pg/mL, respectively. The concentrations of eotaxin showed significant increases with age, with an overall change of 1.41-fold by $t=0.01$. Moreover, no ABO blood type-related differences were observed between eotaxin levels and age was found. However, GDF11 showed a small, but not significant, trend of decrease with age. Interestingly, there was a clear distinction between genders, where eotaxin were observably higher in male than in female ($126.51 \pm 53.09$ pg/mL vs. $112.12 \pm 51.10$ pg/mL; $P<0.05$). Consequently, a slight but significant correlation ($r=0.27$, $P=0.001$) between eotaxin levels and age was found. Therefore, GDF11 showed a small, but not significant, trend of decrease with age. Interestingly, there was a clear distinction between genders, where eotaxin were observably higher in male than in female ($126.51 \pm 53.09$ pg/mL vs. $112.12 \pm 51.10$ pg/mL; $P=0.001$). Moreover, no ABO blood type-related variations were observed for eotaxin and GDF11.

Summary/Conclusions: In general, our findings revealed the plasma concentrations of eotaxin and GDF11 in Chinese blood donors. Except ABO blood type, both age and gender showed different effects on plasma levels of eotaxin and GDF11. And these new data are quite helpful for the further study of young blood plasma.
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INFLUENCES OF ABO BLOOD GROUP, GENDER AND AGE ON FACTOR VII ACTIVITY AND FIBRINOGEN CONTENT IN PLASMA OF BLOOD DONOR

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Background: ABO blood group is a hereditary factor of plasma level of factor VIII. As the growth of the age, the incidence of thrombotic disorders is higher and higher. Fibrinogen and coagulation factor VIII play an important role in the blood agglutination.

Aims: To investigate influences of ABO blood group, gender and age on factor VIII activity and fibrinogen content in plasma of blood donor.

Methods: A total of 193 healthy volunteers, 111 male and 82 female, were enrolled for this study from normal blood donors aged between 18–55 y (mean 31.24 ± 10.66 y) at Fujian Blood Center. Factor VIII activity and fibrinogen content was measured by the clotting assays using commercially available kits (Diagnostic Stago S.A.S., France) on a STA Compart automated coagulation analyzer (Diagnostic Stago S.A.S., France). The phenotype of ABO blood group was determined by serological tests with monoclonal anti-A and anti-B antibody blood grouping reagent kit (Changchun bode biological technology Co., Ltd., Changchun, China) and red blood cells reagent kit for use in ABO reverse grouping (Shanghai blood biological chemical pharmaceutical Co., Ltd., Shanghai, China) on a Hemoteca automated blood group analyzer (HeaTek biological technology Co., Ltd., Beijing, China). Values were expressed as means and standard deviation (SD). Multi-group comparisons between factor VIII activities and fibrinogen levels in different ABO groups were conducted by one-way ANOVA followed by LSD post hoc test. The comparisons of factor VIII activities and fibrinogen levels between genders were accomplished using two-tailed unpaired Student’s t-tests. Bivariate correlation analysis was used to calculate the associations of factor VIII activity and fibrinogen, factor VIII activity and age, and fibrinogen level and age. A 95% CI [2.5%-97.5%] was used and a P-value < 0.05 was considered statistically significant.

Results: The activity of factor VIII was significantly less in group O subjects (722.51 IU/l ± 196.22 IU/l, n = 92) than in group A [888.63 IU/l ± 275.47 IU/l, n = 43, P < 0.001], group AB [872.41 IU/l ± 115.74 IU/l, n = 13, P < 0.05], and group B subjects [933.86 IU/l ± 243.34 IU/l, n = 45, P < 0.001], whereas the fibrinogen level in group O subjects (2.37 g/l ± 0.46 g/l, n = 92) was not significantly different from those in non-group O subjects (2.54 g/l ± 0.65 g/l, n = 43, in group A; 2.37 g/l ± 0.49 g/l, n = 13, in group AB; 2.41 g/l ± 0.54 g/l, n = 45, in group B subjects) (P > 0.05 for all comparison). Comparing with the factor VIII activity in group A, B, and AB subjects each other, there were no significant differences among them. Same as the factor VIII activity, there were no significant differences among the fibrinogen levels in group A, B, and AB subjects. There were no significant differences between the factor VIII activities in the male group and the female group and between the fibrinogen levels in the two groups. Factor VIII activity and fibrinogen level showed significant and positive relationships with age (r = 0.191, P < 0.005 and r = 0.152, P < 0.05, respectively). Fibrinogen level was significantly correlated with factor VIII activity (r = 0.307, P < 0.0005).

Summary/Conclusions: ABO blood group and aging have significant effects on the factor VIII activity in plasma. Fibrinogen level observably increased with age. Fibrinogen content was strongly and positively correlated with factor VIII activity. It is suggested that cryoprecipitate should be prepared from raw plasma from older blood donors in group AB, A and B to get more quantity of fibrinogen and factor VIII.

P-211

ESTABLISHMENT OF THE ACCURATE METHOD FOR DETERMINATION OF ANTI-AB42 ANTIBODIES IN PLASMA AND PRELIMINARY ANALYSIS OF AB42 ANTIBODIES LEVEL IN PLASMA DONORS

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Background: Alzheimer’s disease (AD) has become a global problem. Up to now, few drugs have impeded the neuropathological progression of AD. Intravenous immunoglobulin (IVIg) is another approach that has been examined for treating AD. Although the multiple antibodies including anti-Aβ antibodies in IVIg should give it an advantage over monomolecular antibody for treatment of AD, its encouraging results in pilot studies have not been replicated in larger trials. The development of AD-specific IVlg might be the best chance for IVIg treatment of AD to succeed.

Aims: Establish an accurate enzyme linked immunosorbent assay (ELISA) method for determination of anti-Ab42 oligomers antibodies in plasma and use it to examine anti-Ab42 antibodies level in plasma donors, so as to lay the foundation for preparation of specific IVlg with rich anti-Ab42 antibodies.

Methods: 1) Ab42 oligomers were prepared from synthetic Ab42 peptide at different initial aggregation concentrations and through phosphate buffer saline (PBS) solution, and then Ab42 oligomers were analyzed by SDS-PAGE and western blot. The best aggregation condition was chosen to aggregate Ab42 oligomers. 2) The orthogonal experimental design was established to achieve an accurate determination system for measurement of the anti-Ab42 oligomers antibodies. The performance of the determination system was evaluated. 3) The levels of anti-Ab42 oligomers antibodies were tested in plasma donors from different districts, and the characteristics of the anti-Ab42 oligomers antibodies in plasma donors were analyzed.

Results: 1) The amount of Ab42 oligomers rose with the increase of the initial aggregation concentration. Trimmers and dispersion zones of medium- and high-molecular-weight oligomers were generated from Ab42 at 250, 125 and 62.5 μmol/l when there was no SDS in PBS. Trimmers and medium-molecular-weight oligomers were generated at the same concentrations when SDS was mixed with PBS. 2) The orthogonal analysis showed that the measurement result of anti-Ab42 oligomers antibodies in plasma was heavily influenced by the detection conditions including Ab42 oligomers coating concentration, coating pH, blocking buffer, primary antibody and secondary antibody conditions, and then the best detection system for anti-Ab42 oligomers antibodies was established by orthogonal experiment. Its performance was evaluated. The correlation coefficient was 0.994, the relative deviation of stability was 3.9%, the relative deviation of precision was 4.77%, and the accuracy error was 10.16%. 3) There were great differences in the anti-Ab42 oligomers antibodies levels among plasma donors, ranging from 3.16% to 581.7%. The antibodies in female donors were 10.1% higher than those in male donors and the antibodies increased with age. The level of antibodies in plasma donors from Guizhou was 25.0% higher than that in those from Sichuan. There was no obvious difference in the antibodies between plasma donors with different ABO blood types. The proportion of plasma donors with high antibodies levels from Guizhou is higher than that from Sichuan.

Summary/Conclusions: 1) Appropriate initial aggregation concentrations contribute to the generation of Ab42 oligomers. Addition of 0.05% SDS to PBS could contribute to form stable Ab42 oligomers. 2) The anti-Ab42 oligomers antibodies determination system obtained from orthogonal experiment is stable and can be used to test the plasma samples. 3) The levels of anti-Ab42 oligomers antibodies among plasma donors show great difference and vary with gender, age and region.

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PREPARATION AND EVALUATION OF FREEZE-DRIED CRYOPRECIPITATE

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Background: Concentration of factor VIII from fresh plasma by cryoprecipitation remains the basis for preparation of products used to treat haemophilia A. However, the storage of cryoprecipitate requires −20°C, it’s hard to ensure the storage temperature during military and emergency situation.

Aims: To research the method of freeze-dried cryoprecipitate and evaluate its effect. Methods: Four units of fresh whole blood (200 ml) were collected from volunteer donors. Two bags of cryoprecipitate with same capacity were prepared from each whole blood by conventional method, one bag was stored at −20°C as frozen cryoprecipitate, and the other was prepared into freeze-dried cryoprecipitate after adding Compound Amino Acid Injection by the lyophilizer and stored at 4°C. Two sets of cryoprecipitates from 20 donors were taken out and analyzed for factor VIII, fibrinogen, and pH after 24 h, and the other cryoprecipitates were evaluated after 12 months.

Results: There are no significant differences of factor VIII, fibrinogen, and pH between frozen and freeze-dried cryoprecipitate after 24 h, and 12 months storage, respectively (P > 0.05).

Summary/Conclusions: The freeze-dried cryoprecipitate stored at 4°C after 12 months remain normal factor VIII and fibrinogen contents.

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INFLUENCE OF PLASMA-DERIVED α-2-MACROGLOBULIN ON RED BLOOD CELLS STORAGE

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Background: Red blood cells (RBCs) transfusion is a potentially lifesaving intervention for millions of chronically or massively transfused recipients worldwide every year. Normally RBCs can be stored up to 42 days on the condition of current administration based on MAP (Mannitol adenine sodium dihydrogen phosphate) storage solution. However, the decrease of Adenosine triphosphate (ATP), accumulation of reactive oxygen species (ROS) and cytokines may bring adverse effects on the RBCs, and additionally influence RBCs' therapeutic efficacy. α-2-Macroglobulin (α2-M) is known as a broad spectrum inhibitor of protease, which participates in physiological and pathological processes widely. α2-M also has the potential ability of scavenging free radical and regulating cytokines.

Aims: The aim of this study is to investigate the potential protection influence of α2-M on RBCs during storage period.

Methods: Different concentrations of α2-M were added to RBCs separately, and the final concentrations were 1 g/l (physiological concentration), 9 g/l (3 times physiological concentration), 15 g/l (5 times physiological concentration) respectively. Treated samples were collected at day 7, 14, 30 of storage. Routine blood test, blood gas analysis, crystal osmotic pressure, and free hemoglobin were investigated.

Results: The hemoglobin concentration of samples before treatment is 17.6 g/dl. The hemoglobin concentrations of different α2-M groups ranged from 13.0 to 16.8 g/dl at different time points, and no significant differences were observed. The hematocrit of different samples before treatment is 0.54. The hematocrit of different α2-M groups ranged from 0.5 to 0.52 at different time points, and no significant differences were observed. Both hemoglobin and hematocrit meet the standard of Chinese blood bank technical operation procedure. However, the hemolytic ratio of medium α2-M concentration group (9 g/l) was >0.8 at day 14, 30 of storage. The hemolytic ratio of high α2-M concentration group (15 g/l) was >0.8 at day 7, 14, 30 of storage. The hemolytic ratio of normal α2-M concentration group (1 g/l) was lower than 0.8 at different time points, which met relative quality standard.

Summary/Conclusions: Therefore, α2-M did not bring better protection effect on RBCs storage on the current experimental condition. The concentration of ATP and the influence of crystal osmotic pressure need to be investigated for further improvement of experimental conditions.
while extracellular potassium of RB-L RBCs was higher than untreated ones (20.64 ± 2.19 vs 15.72 ± 0.16 mmol), suggesting changes in Na-K ATPase function. Summary/Conclusions: These results demonstrated that RB-L treatment did not cause severe impact on the structure and metabolic functions of red blood cells. It might be a promising method for prevention of adverse immune responses caused by WBCs.

P-217
Abstract has been withdrawn

P-218
A MITOCHONDRIAL DNA-BASED QUALITY CONTROL ASSAY FOR VALIDATION OF THE PATHOGEN REDUCTION EFFICACY BY METHYLENE BLUE TREATMENT
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Background: Blood transfusion can result in transfusion transmitted infectious diseases (TTIDs). Pathogen reduction technology is an important tool to further reduce the risk of TTIDs. Among all kinds of methods, methylene blue treatment has been used in plasma for a long time. Although its efficacy has been well validated, with the development of regulation, it is necessary to introduce a quality control assay into the process of pathogen reduction. We intend to use the mitochondrial DNA breakeage as a quality control marker to investigate its potential as a novel validation assay for the efficacy of MB treatment.

Aims: To develop a new quality control method for monitoring the efficacy of pathogen reduction by methylene blue treatment.

Methods: Mitochondrial DNA (mtDNA) was extracted from plasma samples before and after methylene blue treatment. Inhibition of PCR amplification of mitochondrial DNA in short and long amplicon target regions, ranging from under 200 base pairs (bp) to over 1800 bp, was measured in treated relative to untreated controls. Results: Inhibition of PCR amplification of long-amplicon mtDNA targets was observed after methylene blue treatment. With the increase of treatment duration, more inhibition was observed. The difference of long-amplicon between untreated and standard-procedure-treated samples was about 1 log. However, the short-amplicon was not affected following MB treatment. Our data from 40 donor samples suggest the difference in crossing point between the long and short fragment might predict the efficacy of MB treatment.

Summary/Conclusions: Mitochondrial DNA-based real-time PCR assay is a promising quality control method that can be used in validating the efficacy of pathogen reduction by MB treatment.

Novel Blood Products

P-219
PROSTAGLANDIN E2 PROMOTES THE DIFFERENTIATION OF EARLY MESODERM AND HEMATOPOIETIC PROGENITOR FROM HUMAN EMBRYONIC STEM CELLS
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Background: Differentiation of human embryonic stem cells (hESCs) into the hematopoietic progenitor cells offers a novel opportunity to obtain pure and therapeutically useful hematopoietic progenitor cells.

Aims: To study the biological functional of endogenous Prostaglandin E2 (PGE2) in early mesoderm and hematopoietic differentiation of hESCs.

Methods: The induced cells from hESCs in the presence of PGE2 were identified by RT-PCR, flow cytometry and colony-forming assays.

Results: Our results demonstrated the PGE2 exposure could alter the gene expression pattern and morphology of hESCs and result in a robust hematopoietic differentiation of them with higher frequencies of CD41+ and CD45+ cells. Using a step-wise induction method, we find that PGE2 signaling plays a critical role in the initiation of the mesoderm differentiation of hESCs. Inhibition of PGE2 synthesis by indomethacin remarkably blocked the BMP-induced mesoderm differentiation of hESCs. Furthermore, Hemogenic endothelium and hematopoietic progenitor cell differentiation were blocked by indomethacin addition. COX-1 knockdown or selective inhibition of COX-1 activity confirmed that COX-1, one of the key enzymes responsible for PGE2 synthesis, is required for mesoderm specification of hESCs, which is the direct target gene of BMP4 signaling in hESCs. PGE2 stimulated the mesoderm differentiation of hESCs via the EP2-PKA-GSK3β/β-catenin signaling pathway.

Summary/Conclusions: Cyclooxygenase-1-derived PGE2 licenses human embryonic stem cell differentiation into mesoderm and hematopoietic progenitor cells. Our data provide novel insights into the function of endogenous PGE2 signaling in the early lineage specification of hESCs.

P-220
THE RESEARCH ON PLURONIC F68 FOR MEGAKARYOCYTE PROGENITOR CELL DIFFERENTIATION
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Background: Hematopoietic stem/progenitor cells show the potential of self-renewal and differentiation ability, and they can differentiate into megakaryocytes and platelet-like clinical cell therapy. However, the differentiation efficiency is low. We attempted to establish an efficient differentiation scheme.

Aims: To observe the effect of Pluronic F68 on megakaryocyte differentiation from hematopoietic stem/progenitor cells in order to obtain more megakaryocyte progenitor cells.

Methods: The cord blood mononuclear cells were isolated and inoculated in cell culture bag or cell culture flask respectively. The WIGGENS shaker and cell culture bags were used to mimic WAVE Bioreactor for three-dimensional (3D) cell culture. At the same time, the cells were cultured in cell flask by conventional two-dimensional (2D) cell culture as control. The induced cells were cultured in 3D culture for morphology, surface marker expression, survival, and cell number on day 14.

Results: In the three-dimensional cell culture, Pluronic F68 was added, and the stained cells were observed by microscope, the nuclear-cytoplasmic ratio was increased, the cell volume became larger and the nuclear shape was irregular, the cytoplasm appeared magenta granules, and the megakaryocyte progenitor cells became more mature. By three-dimensional culture, the expression of CD41/CD61 was (36.30 ± 1.27)% Vs (23.95 ± 1.14%), hence the differentiation for megakaryocytic progenitor cells was significantly higher than that in the two-dimensional control group (P < 0.01). Furthermore, adding Pluronic F68 in three-dimensional culture resulted in highest differentiation efficiency for megakaryocytic progenitor cells (P < 0.01). The cell viability and cell number were no significantly difference (P > 0.05) between three-dimensional culture group containing Pluronic F68 and control group.

Summary/Conclusions: Three-dimensional culture is beneficial for the differentiation of megakaryocytic progenitor cells, but the cell viability was lower than two-dimensional control group, but adding of Pluronic F68, the satisfied cell growth and better induction efficiency were obtained. The research result would provide a new method in megakaryocytes production for clinical application.
P-221
PREPARATION, CHARACTERIZATION AND FUNCTIONAL INVESTIGATION OF DEXTRAN–BOVINE HEMOGLOBIN CONJUGATE AS A BLOOD SUBSTITUTE
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Background: Development of blood substitute is a persistent and urgent need in biomedicine. Dextran can be easily derivatized with various chemical moieties, thus can conjugate with hemoglobin (Hb) to increase the size of Hb and overcome the disadvantages of Hb, such as short half-life, renal toxicity and vasoactivity, to produce a promising blood substitute.
Aims: Herein, a dextran-bovine Hb (dhbI) conjugate was prepared by periodate-oxidized dextran conjugation with the Cy5-93® protection, and the characterization and function of dhbI were investigated.
Methods: The ratio of Hb to dextran40 to NaCNBH3 was 1:1:0.5. The dhbI preserves the structure features of Hb according to infrared spectroscopy and Raman spectral analysis. In vitro, the dhbI showed no obvious effects on red blood cell aggregation and hemolysis rate. After intravenous administration of dhbI to hamsters with hemorrhagic shock, the mean arterial pressure and microcirculatory blood flow showed significant recovery. And the heart, liver, spleen, lung and intestine damages of the shock hamsters were alleviated via histopathologic study.
Summary/Conclusions: Thus, dhbI was expected to act as a potent blood substitute with microcirculation expansion and organ protection ability.

P-222
THE INTERNALIZATION MECHANISM OF A SERIES OF NOVEL CELL PENETRATION PEPTIDES WITH ENHANCED PROTEOLYTIC STABILITY IN SERUM
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Background: Human Blood is a complex system containing various enzymes and immune active substances, which have been proved to be great barriers for drug delivery. We have developed a series of novel cell penetrating peptides (CPPs) consisting of various numbers of - and -arginine residues. These peptides have been proved to be ideal good drug carriers due to high uptake efficiency and enhanced proteolytic stability in serum. Unfortunately, the internalization mechanism of these CPPs is still unclear.
Aims: In this study, we applied FRAP (Fluorescence recovery after photobleaching) to analyze the internalization mechanism of these CPPs.
Methods: All the CPPs were labeled with FITC. The recovering speed of FITC after photobleaching presented the motility of CPPs within the cell membranes.
Results: We demonstrated that the uptake efficiency and proteolytic stability of these CPPs were all significantly affected by the number of -arginine residues in the peptide sequence. CPPs with more numbers of -arginine residues showed with enhanced uptake efficiency and proteolytic stability. And the FRAP experiments showed that CPPs with more numbers of -arginine moved faster within the cell membrane.
Summary/Conclusions: Based on the FRAP experiments, it can be explained that the higher uptake efficiency of CPPs with more numbers of -arginine maybe caused by their faster movement speed within cell membranes. The results here might provide useful guidelines for the design and application of CPPs in drug delivery.

P-223
INHIBITION OF INFLAMMATORY CYTOKINES BY IVIG IS DEPENDENT OF IGG-FC SIALYLATION IN HUMAN MONOCYTIC THP-1 CELLS
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Background: Intravenous immunoglobulin (IVIg) is used to treat patients with autoimmune and systemic inflammatory diseases, but the exact working mechanism is not known. The prevailing studies, which states that Fe-sialylated IgG plays an important anti-inflammatory role, is currently debated.
Aims: The study aimed to prepare the Fe-sialylated IgG (SA-Fe) fraction from Chinese IVIG preparations, and determine the efficacy of SA-Fe fraction to inflammatory cytokines in Human Monocytic THP-1 Cells.
Methods: IgG molecules were split into F(ab)2 and Fe fragments by papain digestion. Then the Fe fragments were purified using Protein G affinity chromatography column and molecular sieve column. After that, the sialylated IgG (SA +IgG) and Fe-sialylated IgG (SA +Fe) were enriched by Sambucus nigra agglutinin (SNA) lectin fractionation. The efficacy of IVIG to inflammatory cytokines was measured by ELISA after adding SA+IgG or SA +Fe in PMA-treated and LPS-stimulated monocyte THP-1 cells.
Results: The fractions of SA+IgG and SA +Fe had high purity antibodies and intact molecular structure. Compared with the normal control group, TNF-α and IL-6 levels in THP-1 cells were significantly increased by LPS stimulating at 24 h (P < 0.05). Compared with the untreated IVIg group and Fe group, the levels of TNF-α and IL-6 were significantly decreased after adding the fractions of SA +Fe at 0.5 mg/ml (P < 0.05).
Summary/Conclusions: IgG-Fe sialylation has strong inhibition of inflammatory cytokines in Human Monocytic THP-1 Cells. Our study could provide a new idea for the study of the new natural anti-inflammatory drug.
Transfusion Transmitted Infections – Screening Strategies for TTI

P-225

Abstract has been withdrawn

P-226

DATA ANALYSIS OF CENTRALIZED BLOOD SCREENING ACROSS THE REGIONS OF HUBEI PROVINCE IN CENTRAL CHINA DURING 12 YEARS (2005–2016)
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Background: Centralized blood screening, a transfusion service model with high quality, high efficiency and low cost, which can optimize the resources distribution of blood services and is a necessary measure to guarantee the safety of blood transfusion, has been extensively utilized in developed countries but this practice starts relatively late in China. The government of China has issued a series of policies and measures to promote centralized blood screening since 2006. Blood banks of Hubei province in central China began to implement this model in five blood services gradually since 2005, including a blood center and four blood banks (Wuhan blood center, Ezhou blood bank, Xiantao blood bank, Tianmen blood bank and Qianjiang blood bank).

Methods: A retrospective study was performed using data of centralized blood screening of five blood services from 2005 to 2016 in Hubei province. Descriptive statistics, such as percentages and rates were computed. The sample size, total qualified rate of blood and deferral rate of related indexes was counted and the rates were compared between regions.

Results: Compared to 2005, the number of sample size involved in centralized blood screening of five blood services from 2005 to 2016 in Hubei province. Descriptive statistics, such as percentages and rates were computed. The sample size, total qualified rate of blood and deferral rate were compared between regions.

Summary/Conclusions: The centralized transfusion model implemented in Hubei province in central China has witnessed the test of time and continues to evolve to meet new situations and ensure blood safety. The quality of services involved in the centralized blood screening has variance, the health consultation and general examination before blood donation should be strengthened in areas with high prevalence of related indexes. The declination of deferral rates of ALT was attributable to repeatable reactive samples. Discrepant serologic and molecular markers are also observed. It is critical to develop more sensitive and specific molecular confirmatory algorithms to limit blood shortage by allowing safe re-entry of donors with discrepant testing results.

P-227

PERFORMANCE OF HEPATITIS B VIRUS (HBV) NUCLEIC ACID ASSAYS IN DALIAN BLOOD DONORS WITH DISCREPANT SEROLOGIC AND MOLECULAR TESTING RESULTS HBV DNA CONFIRMATORY ALGORITHM IS NEEDED
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Background: HBV blood safety remains a major issue in China due to the high prevalence of HBV infection. To reduce the HBV transfusion-transmission risk, a program for HBV, hepatitis C virus and human immunodeficiency virus simultaneously using nucleic acid testing (NAT) was initiated in 2010 in several blood banks across China. The rapid technical evolution of NAT assays is challenging for blood banks that have to re-evaluate their blood screening strategies according to the benefits but also the limitations associated with the implementation of new assays.

Aims: To compare the performance of multiplex NAT assays to detect HBV DNA in HBsAg positive and negative blood donors from Dalian, China.

Methods: Blood donors were screened pre-donation for HBsAg using a rapid test. Eligible donors were further tested with two HBsAg ELISA assays and for HBV by using either Cobas Taqscreen MPX 2.0 (Roche) in 6-samples minipools, ProCleix Ultra ID (Grifols) or ProCleix Ultra Plus ID assays. Samples initially reactive (IR) were discriminated according to manufacturer’s standard procedure. NAT IR/HBsAg+ and NAT IR/HBsAg- samples were retested twice and discriminated once using both ProCleixUltraID and ProCleixUltra Plus ID systems.

Results: First, 23/121,315 (0.2%) donations were tested IR with Ultrio; 93 (1.9%) tested HBsAg+ and were not investigated further. Discriminatory assay performed on 146 NAT IR/HBsAg+ samples identified 30 (20.5%) HBV DNA+, 1 (0.7%) HCV RNA+ and 1 (0.7%) HIV RNA+. Second, 119/5,124 (2.3%) samples were initially reactive with Ultra Plus: 23 (19.5%) HBsAg+ and 95 HBsAg-. Discriminatory testing of HBsAg- samples identified 4/95 (4%) HBV DNA- and 1 (1%) HIV RNA-. Based on direct discriminatory testing without repeat multiplex testing, non-reproducible reactivity rates of 78% [114/146] and 54% [51/95] were observed in HBsAg- samples using Ultrio and Ultra Plus, respectively. In addition, 26 (22%) and 1 (4%) HBsAg+ samples tested NAT non-reactive with Ultrio and Ultra Plus, respectively. In parallel, 98,319 samples were tested with MPX. Positive pools resolution identified 95 (0.09%) HBV DNA+ (51 HBsAg+ and 44 HBsAg-) and 95 (0.09%) HCV RNA+ and 2 (0.02%) HIV RNA+ samples: 19 (27%) HBsAg+ samples were included in NAT non-reactive pools; and no viral nucleic acid was detected in individual HBsAg- samples present in 46% of the pools initially reactive. When tested reactive and discriminated once, 17/85 (20%) and 64/85 (75%) HBsAg+/ NAT initially reactive samples were retested with Ultrio. Discriminatory assay on these samples identified 2 (2.4%) non-repeat reactive samples with Ultrio but failed to detect viral DNA in 3/42 (7%) of Ultrio repeated reactive samples. The rate of initially reactive/non repeated reactive HBsAg+ samples was 70% [99/141] and 34% (11/32) with Ultrio and Ultra Plus, respectively. Confirmatory assay based on virus concentration was developed to definitively characterize the HBV status of HBsAg- patients.

Summary/Conclusions: Ultra Plus improved HBV DNA detection in HBsAg- blood donors compared to Ultrio and MPX assays. The combination of highly sensitive NAT and presence of low levels of HBV DNA may result in a high rate of non-repeat reactive samples. Discrepant serologic and molecular markers are also observed. It is critical to develop more sensitive and specific molecular confirmatory algorithms to limit blood shortage by allowing safe re-entry of donors with discrepant testing results.

P-228

APPLICATION OF ELECTROCHEMILUMINESCENCE IMMUNOASSAY AS A COMPLEMENTATION TEST TO NAT FOR HBV SEROLOGICAL MARKERS IN CHINESE BLOOD STATION
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Background: Nucleic acid test (NAT) is commonly utilized in detecting transfusion-transmitted infections (TTI) in donated blood samples. We applied minipool NAT (MP-NAT) to blood donations for HBV/HCV/HIV detection collected from Nanjing, China since June 2010. However, we found it inconsistent that samples of some pools of MP-NAT positive were resolution NAT negative and some samples of resolution NAT positive were quantity NAT negative.

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Aims: To evaluate electrochemiluminescence immunoassay (ECLI) as a comple- mentation test to NAT for HBV serological markers for better TTI detection accuracy.

Methods: All blood donation samples were tested through ELISA test for HBsAg, anti- HCV, anti-HIV, and anti-treponema pallidium, of which ELISA negative samples were further screened by MP-6-NAT. Samples of being ELISA negative but NAT positive (NAT yield) were confirmed by HBV DNA/HCV RNA/HIV RNA quantity tests, and ECLI of HBsAg, anti-HBs, HBeAg, anti-HBe, and anti-HBc. Samples of being MP-6- NAT positive but resolution NAT negative also went through ECLI of HBV serologi- cal markers.

Results: A total of 275 samples were confirmed as HBV DNA(-)/ELISA(-) from NAT yield, with a median of HBV DNA <100 IU/ml. Based on five ECLI HBV sero- marker reagents, only 19 (7%) were all negative, while the rest were anti- HBs and/or anti-HBe positive. Out of these 275 samples, 119 (43%) were HBV DNA negative according to HBV DNA quantity test. The two groups, HBV DNA negative and HBV DNA positive, however, had no statistical differences in each of seven HBV serological marker combinations (P < 0.01). Hence, we only detect blood samples with one time ELISA and one time nucleic acid test and two ELISA tests in six blood centers, which is such a huge waste. Therefore, since 2015. However, the blood samples still are detected by one time nucleic acid test. What’s more, our lab will make corresponding adjustments on the basis of the evaluation results. And then, we should evaluate our reagents regularly and make adjustments about our reagents in time. At last, we must under- line that there were many uncontrollable factors in this research, such as: the quality of blood samples, the different levels of operators, the different equipments in the laboratories. All of them affected our results directly. Therefore, more objective experimental data is needed urgently in the future.

**P-229**

THE QUALITY EVALUATION OF FOUR ELISA BLOOD SCREENING REAGENTS IN OUR LABORATORY

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Background: The nucleic acid test has been carried out in all blood centers in China since 2015. However, the blood samples still are detected by one time nucleic acid test and two times ELISA test in all blood centers, which is such a huge waste. So shall we only detect blood samples with one time ELISA and one time nucleic acid test? It's up to the quality of ELISA blood screening reagents. We must evaluate all ELISA reagents objectively. Our lab joined a research and undertook the evaluation of four reagents in our laboratory in 2015.

Aims: This research is to evaluate ELISA blood screening reagents, including homemade reagents and imported reagents. On the one hand we can get the quality evaluation of the reagents. On the other hand, we can evaluate the level of our laboratory and our reagents which were used in the research.

Methods: The trial samples which were collected by 19 blood centers in China were single reagent positive or double reagents positive. There were 1,473 HBV samples, 1,229 HCV samples, 1,036 HIV samples and 1,372 TP samples in total. Every sample was detected with the same reagent by three laboratories. When three laboratories gave the same result, we thought that it’s right. If they had different results, we detected them with the confirmatory tests.

Results: 31 reagents were involved in this study, including 24 homemade reagents and 7 imported reagents. The highest sensitivity of HBsAg reagent was DiaSorin reagent, which was 96.2%, the highest specificity of HBsAg reagent was Livzon reagent, which was 99.2%. The highest sensitivity of Anti-HCV reagent was DiaSorin reagent, which was 98.9%. The highest specificity of Anti-HCV reagent was WaiTai reagent, which was 98.4%. The highest sensitivity of Anti-HIV reagent was Bio-Rad reagent, which was 100%. The highest specificity of Anti-HIV reagent was XinChuang reagent, which was 98.7%. The highest sensitivity of Anti-TP reagent was WaiTai reagent, which was 99.2%. The highest specificity of Anti-TP reagent was GIB reagent, which was 98.4%. According to the sensitivity, specificity and the amount of the reagents, DiaSorin HBsAg reagent, Wai Tai Anti-HCV reagent, Xin Chuang Anti-HIV reagent, and Xin Chuang Anti-TP reagent made a good perform- ance in this research. There were four reagents in our laboratory which were evalu- ated in the research. Such as: Livzon HBsAg reagent with 94.59% sensitivity and 99.21% specificity, Kehua Anti-HCV reagent with 96.53% sensitivity and 98.12% specificity, WaiTai Anti- HCV reagent with 97.72% specificity and 98.44% WaiTai Anti-HIV reagent with 98.53% sensitivity and 96.43% specificity. Obviously, the sensi- bility of Livzon HBsAg reagent was lower than others. However, the other three reagents were much better than others in this study.

Summary/Conclusions: The results showed the sensitivity and specificity of reagents clearly, which can supply suggestions to us. Especially, when we detect blood samples with only one time ELISA and one time NAT, we must make sure to get the accurate results. What's more, our lab will make corresponding adjustments on the basis of the evaluation results. And then, we should evaluate our reagents regularly and make adjustments about our reagents in time.

**P-230**

ANALYSIS OF INVALIDATED RESULTS BY THE NUCLEIC ACID TEST ON BLOOD SCREENING

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Background: In October 2015, the National Health and Family Planning Commis- sion of China issued a notice that nucleic acid test (NAT) technology would be nationwide applied in blood screening at all the blood donation and supply institu- tions by the end of 2015. According to the Blood Donation and Supply Institu- tions Operation Procedures (2015 edition), it was explicitly stipulated that on the basis of ELISA method, all blood products must be rescreened by NAT. Moreover, based on the monitoring of the testing performance termed 4.8, the real-time moni- toring was required to detect any possible changes in handlings and operations, so as to prevent the failure of the batched experiment or the missing detection of weak positive samples.

Aims: To analyze the cause of the invalid results for Coba’s 201 system and for- mulate corrective actions to reduce the possibility for testing failure and missing detection and ensure the safety of blood transfusion.

Methods: After simultaneously tested by two different ELISA reagents for HBsAg, anti-HCV and anti-HIV1/2, blood samples (except double ELISA positive samples) were also analyzed with NAT. The invalid results were identified and calculated in line with Roche Coba’s 201 kits from January 2013 to December 2016. According to detection time, detection systems, regents Lots, the amplification graphs and test alarm information, the cause of invalid results were further analyzed to formulate a general standard for future work.

Results: Among 52 415 pools (306 208 samples) tested by Roche Coba’s 201, 1 372 NAT invalid were found (the total invalid rate: 2.62%). From 2013 to 2016, the NAT invalid rates were 2.01%, 2.03%, 3.82% and 2.74%, respectively (c2 = 93.047, P < 0.05). Among the cause for invalidation, the invalid rate for reagent quality control non-reaction was highest (18.78%). The NAT invalid rate of MPX2.0 reagent (1.25%) was higher than MPX1.0 reagent (1.85%, c2 = 115.730, P > 0.05). The NAT invalid rates of different MPX2.0 reagent Lots had statistical differences (c2 = 698.217, P < 0.05), and the reagent Lot 1 was the highest invalid rate (10.44%). The machine operation failure rate was the second type (34.59%), the CAP reagent needle detection error and liquid path error was higher (38.82%). There was statistical difference between the invalidation rates of A and B detection systems (c2 = 6.279, P = 0.05), and the detection system B was much higher (2.84%).

Summary/Conclusions: Through monitoring the invalid rates for NAT results, it can be timely to identify potential problems in the testing processes of laboratory, for- mulate procedures for monitoring the running test and verifying the testing reagents and external quality control products, ensure the effectiveness of the blood-donors’ results and comparability of the testing reagents Lots, reduce the cost of NAT reagents and evaluate the quality management system operation in our NAT laboratory.

**P-231**

Abstract has been withdrawn
COMPARISON OF ENZYMELINKED IMMUNOSORBENT ASSAY AND CHEMILUMINESCENT IMMUNOASSAY FOR HUMAN IMMUNODEFICIENCY VIRUS SCREENING IN BLOOD DONORS
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Background: In Chinese Mainland, each screening lab of blood bank was using double enzyme-linked immunosorbent assay (ELISA) screening followed by nucleic acid test (NAT) to detect indicators of human immunodeficiency virus (HIV). In 2016, a new version of national regulations on blood screening tests in blood donors was released in China, in which, beside of classic ELISA, chemiluminescent immunomunassay (CLIA) was also introduced as an optional method in blood-donor serological screening.

Aims: To compare the performance of a CLIA system with classic ELISA methods in HIV serological screenings among blood donors.

Methods: From Apr 1 to Jun 30 2017, 23,105 blood-donor samples were detected by two local ELISAs (DVANTEAL Biopharm and InTec) for antigen/antibody (Ag/Ab) of HIV and then NAT for HIV RNA (Roche Cobas12), Nineteen ELISA positive samples and 70 ELISA negative samples were analyzed by a CLIA system (e411) and the former were also sent to CDC for further confirmations. One donor of ELISA negative/NAT reactive was traced and samples were collected every week until fourth week after donation.

Results: Nineteen ELISA positives and one ELISA negative/NAT positive were detected. All the seventy ELISA negative samples showed negative CLIA results. Among 19 ELISA positives, three samples indicated NAT reactive/CLIA positive results were confirmed as true positives, four of which showed CLIA positive results. For the only ELISA negative/NAT positive sample, CLIA test suggested a positive HIV Ag/Ab result (COI: 1.01). And by the fourth week after his donation, HIV Abs were detected from his blood sample by ELISA and then confirmed true positive by CDC.

Summary/Conclusions: We observed that chemiluminescent immunoassay showed good sensitivity and specificity in HIV Ag/Ab screenings among blood donors, especially for donors in window phase of HIV infections. It could be a practicable strategy to replace classic ELISA method with CLIA as serological assay in HIV screening tests.

PREVALENCE OF SEROLOGIC MARKERS AMONG BLOOD DONORS WHO USE CONFIDENTIAL UNIT EXCLUSION (CUE) IN KURDISTAN PROVINCE, IRAN
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Background: The Confidential unit exclusion (CUE) option has been used to reduce blood safety at blood transfusion.

Aims: This study aimed to compare the results of serologic markers between blood donors who chose the CUE option (‘should not use’) and negative (‘can be used’).

Methods: This cross-sectional study was done at the Kurdistan Blood Transfusion Center, Iran, between 2011 and 2014. Serologic tests were performed using commercial products to detect surface antigens of the hepatitis B virus (HBsAg), antibodies against the hepatitis C virus (anti-HCV) and antibodies against the human immunodeficiency virus (anti-HIV). The seropositive results were confirmed using the confirmatory assays.

Results: Of the qualified donors, 98847 donors (91180 male and 7667 female) during 2011 and 2014 gave blood; 10088 [30.4%] donations were from first-time and 68759 [69.6%] donations were from repeat donors. The CUE option was chosen by 918 (26 female and 892 male) donors. Out of this number, 515 [58.2%] were first time donors and 383 [41.8%] repeat donors. The prevalence of confirmed HBsAg was 0.9% (5/918) and 0.2% (207/97929) among CUE-positive and negative donors, respectively (P = 0.03). The prevalence of confirmed anti-HCV was 0.7% (7/918) and 0.04% (47/97929) among CUE-positive and negative, respectively (P < 0.001). The prevalence of confirmed anti-HIV was 0.1% (1/918) and 0.008% (8/97929) among CUE-positive and negative donations, respectively (P < 0.01).

Summary/Conclusions: Because of the higher prevalence of serologic marker positivity in donors who chose the CUE option, offering CUE to blood donors could be a potentially useful method for improving blood safety.

APPLICATION OF RISK MANAGEMENT TO ESTABLISH THE QUALITY MANAGEMENT SYSTEM OF DETECTION PROCESS IN BLOOD BANK SCREENING LABORATORY
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Background: The purposes of blood bank screening laboratory is ensure blood safety, and prevent transfusion infection by blood transfusion virus. To eliminate the hidden dangers, and prevent quality accidents is the most basic requirement of the quality management. Therefore, risk management should be applied to establish and manage the quality management system of the screening laboratory.

Aims: Applicate the risk management, to identify and evaluate each critical control point of detection process. According to the results of identification and evaluation, establish management measures, and ensure that the detection process management system can be fully effective and feasible operation. Explore the application of risk management in blood bank screening Laboratory quality management.

Methods: According to the characteristics of blood screening laboratory quality management, establish the risk rating table, and use the table to carry out risk evaluation and risk response of the detection process. According to the results of risk evaluation and response, establish the process quality management system, and develop the Standard operating procedures of detection process.

Results: According to the impact of the blood safety, the risk levels is divided into four levels at the risk rating table: mild, moderate, severe and critical. Each level develop the corresponding response principle. Among the 21 critical control points of the detection process, 2 were moderate, 8 were severe, and 10 were critical. According to the different risk levels of critical control point, develop targeted response measures, and draw up the 7 relevant standard operating procedures.

Summary/Conclusions: Explained the process uncertainty clearly by risk management, combined with the characteristics of blood screening laboratory, the dynamic and continuous management of the testing process can ensure the effective and feasible of quality management measures. Risk evaluation and risk response of the critical control point can ensure the systemic and adequacy of the quality management system, and ensure that the system is dynamically and continually improved.

A CHEMILUMINESCENCE BASED APPROACH TO NUCLEIC ACID TESTING TO DETECT HBV, HCV AND HIV-1 IN BLOOD SCREENING
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Background: Hepatitis B virus (HBV), Hepatitis C virus (HCV), and human immunodeficiency virus (HIV) are life threatening blood borne infections that can be unintentionally transmitted in transfused blood products.

Aims: To establish a highly sensitive, specific and fast method which is different from the existing methods to detect HBV, HCV and HIV-1 in parallel utilizing a NAT technique that incorporates PCR-chemiluminescence.

Methods: Viral genomes were extracted from donated serum samples using magnetic nanoparticles. The isolated viral DNA and RNA were amplified in a one-step...
parallel RT-PCR reaction. HBV, HCV and HIV-1 were detected using complementary nucleic acid probes and quantified using a chemiluminescent substrate.

**Results:** The length of the amplified PCR products for HBV, HCV and HIV-1 were 119 bp, 220 bp, and 174 bp, respectively, indicating that the extraction methods had successfully isolated high quality viral genomes from primary serum samples. The probes and reaction conditions used for chemiluminescent detection of HBV, HCV and HIV-1 genomes in unknown primary samples were empirically optimized. Of the 10,422 blood samples screened, 12 were HBV positive and 2 were HCV positive. These results were consistent with those of parallel-controlled study using Roche Cohas TaqScreen MPX Test kits.

**Summary/Conclusions:** The assay described is fast, accurate and sensitive for detecting HBV, HCV and HIV-1 in parallel that has broad implications for blood screening and epidemiological studies.

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**P-239**

**CONFIRMATION OF THE OPTIMAL SIGNAL-TO-CUTOFF RATIOS OF ELISA KIT FOR HIV AND TREPONEMA PALLIDUM ANTIBODY**

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**Background:** Most Chinese blood banks adopt double ELISA for HBsAg, anti-HCV, anti-HIV, anti-Treponema pallidum and borderline to avoid false negative. Any sample of signal-to-cutoff ratio above borderline of either ELISA test is defined as reactive. Although it assures blood safety to some extent, as a result of false positive, a lot of blood was wasted.

**Aims:** To discuss the necessity of setting borderline of ELISA kit for HIV and Treponema pallidum antibody.

**Methods:** China national center for clinical laboratories performed a program to assess the sensitivity and specificity of ELISA kit in domestic market. During Jun 2015 to Dec 2015, 17 blood banks and their reactive samples including double-reactive and single-reactive ones were included. A total of 1016 anti-HIV reactive samples were confirmed by nucleic acid test and western blot (WB), while 1378 Treponema pallidum reactive samples were confirmed by Treponema pallidum particle agglutination assay (TPPA) and western blot (WB). Each sample being reactive with either method was confirmed as positive. Receiver operator characteristics (ROC) curves were performed to determine the optimal S/Co ratios.

**Results:** Among seven manufacturers’ ELISA kits for anti-HIV, the Youden index reached maximum when the S/Co ratios of reagent coded 23001 (Youden Index = 0.98) got to 1 and reagent 23081 (Youden Index = 0.97), 23043 (Youden Index = 0.96), 23001 [Youden Index = 0.98], 23107 (Youden Index = 0.96). 23089 (Youden Index = 0.98) and 23085 (Youden Index = 0.97) to 5. While among five manufacturers’ ELISA kits for anti-TF, the Youden index reached maximum when the S/Co ratios of reagent 23003 (Youden Index = 0.87) and 23016 (Youden Index = 0.90) to 1, reagent 23081 (Youden Index = 0.88) and 23043 (Youden Index = 0.90) to 3, and reagent 23001 (Youden Index = 0.90) to 5.

**Summary/Conclusions:** Since the optimal S/Co ratios of 7 ELISA kit for anti-HIV and 5 for anti-TF tested are all above 1, there is no need to set borderline.
P-242
STUDY ON REENTRY EVALUATION MODE FOR BLOOD DONORS USED TO BE HBV REACTIVE
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Background: In China, blood banks implement a screening strategy of dual serology test and then nucleic acid test (NAT). Donors of suspected transfusion transmitted infection are quarantined permanently. To balance blood supply and blood safety, we have developed strict principles for donors reentry in Jiangsu Province, China. Considering high prevalence of HBV in China, we strengthen the reentry principles for donors used to be HBV reactive to identify occult HBV ones. Aims: To investigate the feasibility of HBV reentry strategy. Methods: Donors having been quarantined for more than 6 months could propose for reentry application and samples were drawn. All donor samples were routinely screened by dual-ELISA for HBsAg, anti-HCV, anti-HIV and anti-Treponema pallidum and those non-reactive ones were tested by minipool of NAT for three times. To identify occult HBV donors, samples of NAT non-reactive were further tested by ECLIA for HBV seromakers. Donors of only 4 ECLIA patterns were accepted to reentry: all 5 HBV seromarkers negative, anti-HBs only but having history of hepatitis B vaccine injection, anti-HBc only, anti-HBs/anti-HBc with anti-HBs more than 200 IU/L. Additionally, ECLIA detection rate of HBV infection was compared with ELISA and NAT. Results: During Oct 2016 and June 2017, a total of 166 HBV-reactive donors have applied for reentry, among which 156 were quarantined for HBsAg reactive and another 10 were quarantined for HBV DNA reactive. Among the 3 screening methods, the highest HBV yield (40.3%, 67/166) was observed on ECLIA, while only 3.6%(6/166) on ELISA and 5.4%(9/166) on NAT. Increased detection times of NAT from one to three times can help improve detective rate of OBI donors from 3%(5/166) to 5.4%(9/166). Among 4 ECLIA patterns, anti-HBs reactive only but having history of hepatitis B vaccine injection, amounted the most (41.6%), with a median anti-HBs concentration of 338.5 IU/L. Summary/Conclusions: Routine screening tests merely based on ELISA and NAT could miss occult HBV donors and may decrease blood safety. Anti-HBs (quantitative)anti-HBs and history of hepatitis B vaccine injection should be added to evaluate reentry donors used to be HBV reactive.

P-243
THE EFFECTS OF CARRYING OUT NUCLEIC ACID TEST AND SEROLOGICAL TEST SYNCHRONOUSLY
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Background: Since March 1, 2016, the 2015 edition of the technical operation regulation of blood stations has been formally promulgated and implemented, and nucleic acid detection has been carried out in an all-round way. Aims: By analyzing the effect of nucleic acid detection and serological detection in parallel detection mode, we comprehensively evaluated the role of nucleic acid detection and serological detection in reducing the risk of transfusion-related infection. Methods: We collected a total of 73559 samples of blood donors from March 1, 2016 to May 31, 2017 and then carried out serological tests (HBsAg, anti-HCV, HIV antigen/antibody, anti-TP, ALT and blood type) and about HBV, HCV, HIV nucleic acid combined qualitative tests. We counted the detection rate of each test, and then compared and analyzed the results of the serological test and NAT. Results: Of the 73559 samples tested, we found that the number of the result that both serological tests and nucleic acid test were positive was 407 (0.55%).The number of the result that just the nucleic acid test was positive was 489, and its detection rate was 0.67%. After discriminating experiment, 131 samples’ result of HBV DNA was positive, not found that HCV RNA and HIV RNA was positive. There were 61 samples of negative nucleic acid test and the test of the two serological reagent tested positive, HBsAg(144, anti-HCV(117), no HIV antibody/antigen positive sample. Summary/Conclusions: NAT is effective for detection of HBsAg(-) HBV infection in blood donors. The results of NAT and serological detection are inconsistent and have some compensatory effects. After the full implementation of NAT, its role will have to be rigorously validated for the impact of serological reagents and strategy choices.

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Abstract has been withdrawn

P-245
TRENDS IN TRANSFUSION TRANSMISSIBLE INFECTIONS (TTIs) SEROREVAlENCE AMONG NEPALESE BLOOD DONORS
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Background: Blood transfusion an important therapeutic option in the life-threaten- ding disease conditions and in sustaining life after severe blood loss. But this life sav- ing procedure may also put people at risk due to infusion of infectious agents from the infected blood of the donors. The most common transfusion-transmissible infec- tions (TTIs) are human immunodeficiency virus (HIV), hepatitis B virus (HBV), hep- atitis C virus (HCV), Treponema pallidum and malaria parasites. The world health organization (WHO) recommends that all donated blood and blood components should be screened for the presence above mentioned TTIs agents before being used for clinical or for manufacturing purposes. TTIs can exist as asymptomatic in their hosts, so donors must be screened for high-risk behavior. Although, in current situa- tion the risk of common TTIs is lower than ever, the supply of safe blood products remains subject to contamination with yet to be identified human pathogens. Only continuous improvement and implementation of donor selection, sensitive screening tests, and effective inactivation procedures can ensure the elimination, or at least reduction, of the risk of acquiring TTIs. Aims: In Nepal, mandatory screening tests are performed for HIV 1 and 2, HBV, HCV and syphilis, as recommended by the Nepal Red Cross Society (NRCS) and Central Blood Bank Transfusion service (CBTS). However, there is limited information on trends of TTIs in Nepalese blood donors. In an extensive study conducted from 2001 to 2007 in over 500,000 donors, the overall decreasing trend was observed for HBV and HCV seroprevalence, both nationwide and in CBTS. In a different study it was reported that the prevalence of HIV sero positivity among blood donors ranged from 0.019% to 1.26%. In terms of syphilis, the prevalence of sero positivity among Nepa- lese males was 0.60%. However, these studies lacked data on increasing or decreas- ing trend for HIV and syphilis in blood donors. Hence, the aim of this study was to examine the trend of sero positivity for TTIs in voluntary blood donors in Nepal that reflects safety of blood products supplied by the transfusion centers. Methods: A retrospective study for the prevalence of TTIs- HIV, HBV, HCV and Syphilis on 7,744 voluntary blood donors visiting Blood bank of Tribhuvan University Teaching Hospital (TUTH), Kathmandu from 2006 to 2015 was done. Antibodies for TTIs were tested using ELISA and Spot test. The analysis was performed using SPSS. Results: As reported previously, we also observed a decreasing trend for HBV and HCV sero positivity in Nepalese blood donors. Importantly, we observed similar decreasing trend for HIV [0.36% in 2007 to 0% in 2015] and syphilis [0.3% in 2006 to 0.1% in 2015] sero positivity. The analysis further revealed that in certain years between 2006 to 2015 there were instances when HIV sero positivity among blood donors were null. Summary/Conclusions: Putting all data together, we conclude that there is a decreasing trend for sero positivity for TTIs among Nepalese blood donors. To our knowledge, this study is the first of its kind that include all four common TTIs as recommended. This observation reflects that people are more aware of such infec- tions that ultimately results in safer blood supply.

P-246
TRENDS IN THE PREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS AMONG BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN NORTH INDIA: EIGHT YEARS’ EXPERIENCE
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Background: The prevalence of transfusion transmitted infections (TTIs) among the blood donors not only represents the prevalence of the disease in the general popu- lation but also indicates the quality of donor screening through questionnaire and pre donation counseling.

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Aims: To find the prevalence of TTI among the blood donors in the last 8 years and to see the prevalence among the 2 sexes.

Methods: The donor samples were screened for HIV (anti-HIV), HBV (HBsAg) and HCV (anti-HCV) tests by the ELISA technique till May 2013 after which it was replaced by the chemiluminescence method. Donors are screened for syphilis by the rapid plasma reagin technique (RPR) whereas for malaria, rapid card tests were used. All the data was entered into excel sheet and analyzed. Results: The total number of donors screened during the period June 2009 to July 2017 in the Department of Transfusion Medicine of our institute is 44031 of which 97.6% were male and 2.4% were female (39717 replacement; 686 voluntary). The distribution of total reactive samples from 2009 to 2017 is as follows: 4.63% (4 male; 1 female) in 2009, 1.96% (26 male; 1 female) in 2010, 2.60% (76 male; 2 female) in 2011, 2.21% (86 male; 3 female) in 2012, 3.36% (180 male; 5 female) in 2013, 3.13% (190 male; 5 female) in 2014, 1.05% (226 male; 7 female) in 2015, 2.37% (184 male; 7 female) in 2016 and 2.05% (82 male; 2 female) in 2017. During the 8 year period, HIV accounted for 12.8% (95.3% male; 4.3% female), HCV accounted for 23.4% (96.8% male; 3.2% female), HBV: with the highest prevalence, accounted for 60.9% (97% male; 3% female), syphilis accounted for 3.8% (100% male), malaria: with the lowest prevalence accounted for 0.63% (85.7% male; 14.3% female) of the reactive cases. The reactive cases also included 10 samples of HIV and HBV co-infections, 4 samples of HBV and HCV co-infections, 3 samples of HIV and syphilis co-infections, 1 sample of HBV and syphilis; and 1 sample of HCV and syphilis co-infections. So the overall seroprevalence of HIV is 0.3%, HBV is 1.65%, HCV is 0.64%, syphilis is 0.1% and malaria is 0.02%.

Summary/Conclusions: The analysis of the data reveals that the prevalence of TTI has decreased from around 4% in 2009 to around 2% in the donors in 2017. However, the seroprevalence of each infection at our center is less as compared to that seen by Memon et al in their blood bank located in the southern part of the country and higher than that of Saini et al, whose blood bank in central India.

P-247
Abstract has been withdrawn

P-248
Abstract has been withdrawn

P-249
HTLV INFECTION AMONG VOLUNTARY BLOOD DONORS IN ZHEJIANG PROVINCE CHINA
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Background: To prevent the blood transmission of human T-cell lymphotropic virus (HTLV), Zhejiang Province China have introduced anti-HTLV blood screening.

Aims: To assess the prevalence of HTLV infection in Zhejiang Province, China.

Methods: 681,096 blood samples were obtained from voluntary blood donors from 12 blood collection agencies in Zhejiang Province (from March 1, 2016 to March 31, 2017). Initial screening for HTLV-1/2 antibody was performed using the anti-HTLV-1/2 antibody ELISA kit. 238 positive samples identified by ELISA were confirmed by Western Blotting (WB).

Results: 23 (1/30 047) cases were confirmed as positive for HTLV-1. Infected blood donors are located in 5 cities, Jinhua (3 cases, 3/53 302, 0.06%), Wenzhou (9 cases, 9/102 419, 0.09%), Taizhou (3 cases, 3/107 569, 0.029%), Hangzhou (5 cases, 5/156 412, 0.03%), and Liushu (3 cases, 3/66 673, 0.047%). The other 7 cities have not yet found positive blood donors. Confirmatory tests were carried out to analyze the hands of 23 positive specimens and found that they belonged to type HTLV-1.

Summary/Conclusions: HTLV infection blood donors in Zhejiang province are in uneven distribution around different city, and residual risk of HTLV infection via blood transfusion should be assessed, which is the basis for different areas' comprehensive screening strategies to further improve the safety of blood transfusion.

P-250
COMPARISON OF TWO NUCLEIC ACID TESTING SYSTEMS AT BLOOD SCREENING LABORATORY
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Background: Nucleic acid technology is a new technology for detecting the nucleic acid of virus. NAT increases the sensitivity of screening, so the risk of infection through transfusion could be reduced. Many countries have already implement NAT in blood donor screening for more than 10 years. After the research and evaluation in some blood centers, National Health and Family Planning Commission said that NAT must be carried out in all blood banks in our country before January 1, 2016. Two kinds of nucleic acid testing systems were used for blood screening after the ELISA screening in our laboratory from January 1, 2016.

Aims: To discuss the role and significance of NAT in blood centers by comparing the application of two different nucleic acid screening systems.

Methods: From January 1, 2016 to September 30th, 2017, ELISA-negative blood samples were tested by Shanghai Kehua and Novartis TIGRIS nucleic acid screening systems to detect HBV DNA - HCV RNA and HIV RNA. The reactive samples were determined with the Novartis Ultro Plus discriminatory tests and Kehua split tests.

Results: A total of 63753 specimens were detected by Shanghai Kehua system, and 46 mixed specimens were determined to be positive [the positive rate of mixed detection is 0.072%], among which 16 pools were determined reactive by split testing. The number of reactive samples was 16, among which 15 was HBV DNA (the positive rate is 0.235%), 1 was HIV RNA (the positive rate is 0.015%). The effective split ratio was 34.8%. For the Novartis Ultro Plus test, 81 samples out of 69522 were reactive (the positive rate is 0.117%), while 35 specimens of the initial reactive samples were confirmed to be HBV DNA reactive (the positive rate is 0.503%), and 2 samples were confirmed to be HIV RNA reactive (the positive rate is 0.028%). The positive rate in the discrimination assays was 45.7%.

Summary/Conclusions: Both Novartis TIGRIS and Shanghai Kehua screening system can detect positive samples, but the Novartis TIGRIS system shows an apparently higher sensitivity, specificity and positive rate than the latter. NAT can ensure the safety of blood transfusion, but at the same time, it produces some false positive results. So, further tests must be designed to verify the initial reactive samples.

P-251
THE COMPARATIVE STUDY OF CYTOMEGALOVIRUS IGG SEROPREVALENCE AMONG BLOOD DONORS IN WUHAN IN 2016 AND 1990
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Background: Cytomegalovirus (CMV) can be transmitted by blood transfusion. As early as 1990, the positive rate of CMV-IgG among the blood donors in Wuhan was researched, now, more than 20 years later, in order to explore the change of positive rate of CMV-IgG in blood donors in Wuhan, the same research was again performed. By comparing the data between 1990 and 2016, the change of positive rate of CMV-IgG among the blood donors in Wuhan and relating factors were analyzed and were reported as followed.

Aims: To study the change of cytomegalovirus (CMV) IgG seroprevalence among blood donors in Wuhan in between 2016 and 1990.

Methods: CMV-IgG in 440 plasma samples from blood donors in Wuhan in 2016 were tested and the seroprevalence were compared with the one in 1990.

Results: In 2016, the total CMV-IgG seroprevalence among blood donors in Wuhan was 88.86%, which were lower than the one in 1990 (95.20%, P < 0.01). In 2016, the CMV-IgG seroprevalence among male blood donors in Wuhan was 88.24%, which were lower than the one in 1990 (95.43%, P < 0.01). In 2016, the CMV-IgG seroprevalence among female blood donors in Wuhan was 89.60%, which were lower than the one in 1990 (94.95%, P < 0.05). Both in 1990 and 2016, whether male or female, the positive rate of CMV-IgG among blood donors in Wuhan increased with the age.

Summary/Conclusions: The positive rate of CMV-IgG among blood donors in Wuhan has fallen, which is related to the improvement of the social and economic status of our country and the only-child policy. With the advent of the two-child policy and Chinese aging, the controlling of CMV infection should be strengthened.
Investigation of HTLV Prevalence Among Blood Donors in a Region of Central China

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Background: Human T-cell lymphotropic viruses (HTLV) may be transmitted through blood transfusion and screening all blood donors for HTLV is mandatory in many countries. However, this screening strategy is now being adopted only by several provinces in southern and eastern China. HTLV prevalence data of the blood donor population in other regions or areas of China are lacking currently.

Aims: The aim of this study is to investigate the prevalence of HTLV among voluntary non-rutemered blood donors in a region of central China where centralized blood screening is implemented since 2005.

Methods: Anti-HTLV-I/II was screened by enzyme-linked immunosorbent assay (ELISA) among blood donors from Wuhan city, Ezhou city, Xiantao city, Qianjiang City and Tianmen city between June and August in 2016. Results were interpreted according to the manufacturer’s instructions. Primarily reactive samples were retested by double hole review, and repeated reactive samples were further confirmed by Western Blot (WB) and fluorescent PCR.

Results: During the study period, 43566 specimens of blood donors were screened, 11 primarily reactive samples were screened, 4 repeated reactive samples were detected induplicate and none of them were confirmed for anti-HTLV-I/II by WB and HTLV RNA by fluorescent PCR.

Summary/Conclusions: The results suggested that the Wuhan area is a low-prevalence region for voluntary non-rutemered blood donors in terms of HTLV-I/II infections. Whether to implement universal HTLV-I/II screening for blood donors in this area need further inquire on two aspects: cost-effectiveness of blood screening and safety of transfusion. Targeted screening for donors coming from endemic region, such as Fujian province, southeast China in combination with universal leucodepletion treatment of blood components can be considered an effective strategy to prevent HTLV-I/II virus infections by blood transfusion with cost savings and without affecting blood safety.

The Primary Feasibility Study on the Re-entry of NAT Reactive Blood Donors

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Background: Blood safety in China has been greatly improved as the further development of non-rutemered blood donation and technological progress including blood borne disease screening. While false-reactive results inevitably remain, largely due to technology restriction such as methodology, quality of reagents and specimens, and human errors. Therefore blood services shall have the obligation to establish effective and reliable re-entry procedures for donors with false-reactive results, so as to eliminate the consequent adverse effects left on donors’ reputation, rights and interests.

Aims: To analyzed the feasibility of re-entry of NAT reactive blood donors.

Methods: ELISA negative and NAT Reactive Blood Donors in 2012-2014 were selected and made an appointment for the first time. Blood samples collected were tested: ELISA (HBsAg, Anti-HIV and Anti-TP) and NAT (HBV-DNA, HCV-RNA and HIV-RNA). ELISA/NAT- samples were tested by ECLA for HBsAg, HBeAg, Anti-HBs, Anti-HBe, Anti-HBc, Anti- HCV, HIV-Ab. Results: 30 donors were called back, and 11 of them were ELISA negative and NAT reactive, which were deferred permanently. 19 of them were ELISA negative and NAT negative, and the ECLA results were 89.5% ELISA/NAT- donors were Anti-HBc+ or Anti-HBe+. Anti-HBc+ or Anti-HBe+ donors had risk of infection, which were deferred permanently.

Summary/Conclusions: In the view of blood safety, it is important that establish a set of program to re-entry of ELISA/NAT- blood donors.

HTLV Screening in Blood Donors in Shaoxing

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Background: Human T-lymphotropic virus (HTLV) is a retrovirus which can be transmitted through blood transfusion. The effective method to prevent HTLV transmission by blood transfusion is HTLV screening in blood donors. HTLV already screened in many developed countries, while Whether HTLV should be included in the screening of blood donors and how our country should carry out HTLV blood screening were discussed. It was reported that there were HTLV prevalent in some southeast coastal areas in China, but we have no data on the epidemiological characteristics of Shaoxing, one of the southeast coastal city in China.

Aims: To understand the epidemiological characteristics of human T-lymphotropic virus (HTLV) in blood donors in Shaoxing so as to provide the reference for establishing blood screening strategy formulation.

Methods: 47656 specimens from blood donors in Shaoxing were screened by ELISA, TRIFA and double-antigen sandwich ELISA on FAME platform (Hamilton) in parallel. All repeatedly reactive (RR) samples discordant between the two systems were investigated by confirmatory assays. The positive coincidence rates, negative coincidence rates and total coincidence rate of HBsAg, anti-HCV, HIV Ag/Ab and anti-TP between two systems are 90.9%/99.61%/99.57%, 100.0%/100.00%/100.00%, 50.0%/96.9%/99.62% and 87.50%/99.81%/99.76%, respectively. There are 7 HBsAg reactive cases screened by TRIFA were subjected to chemiluminescence microparticle immunoassay (CMA, Abbott) and 4 cases remained to be reactive. One anti-HCV reactive case screened by TRIFA and double-antigen sandwich ELISA was subjected to recombinant immunoblot assay (RIBA, MFJ) and the result is not changed. The result of the same sample screened by indirect ELISA is non-reactive for anti-HIV. The results of HIV Ag/Ab screened by TRIFA presented 7 false positive cases but no reactive existed which were confirmed by CMA (Abbott). As to anti-TP, there are 4 reactive cases identified by TRIFA were subjected to treponema pallidum particle agglutination assay (TPPA, Fujii) and the results fall into grey zone.

Summary/Conclusions: There are some discrepancies in the results of two systems on screening of HBsAg, anti-HCV, HIV Ag/Ab and anti-TP. We found that compared with ELISA, TRIFA is more sensitive and effectively avoid false negative and the results of TRIFA better match up with those of the confirmatory tests on HBsAg, anti-HCV and anti-TP. This screening method can well meet the demands of blood stations on the performance of the detection of transfusion transmitted infections in terms of sensitivity and specificity.
Results: 8 reactive specimens were found. The reactive rate of screening test on HTLV was 0.17%, while none was confirmed to positive, the positive rate was 0.00%.

Summary/Conclusions: The prevalence rate of HTLV in blood donors of Shaqinxi was very low, there was high false positive rate while HTLV screening by ELISA method.

P-257
ANALYSIS OF SYPHILIS SCREENING POSITIVE POPULATION AMONG GANSU PROVINCE BLOOD DONORS
Gansu Blood Center, Lanzhou, China

Background: According to statistics of legal communicable diseases in Gansu province, the incidence of syphilis in Gansu province was 0.018% in 2013 and 0.020% in 2015, and the province reported a number of the top five class b infectious diseases. So, we should master the distribution and prevalence of syphilis in the blood donation population in Gansu province, we should make the basic data analysis for the screening and returning strategy of syphilis positive blood donors.

Aims: By analyzing the structure of the blood donors syphilis antibody screening positive population in Gansu province, provide the basis for recruiting safe blood source strategy, provide basic data for the development of Gansu province syphilis reactive donors reentry strategy.

Methods: By Collecting syphilis detection results of Lanzhou city in 2011 - August 2016 blood donors, statistical analysis was conducted. By Collecting syphilis detection results of Lanzhou city and the three blood stations in the province in 2015 - August 2016 blood donors, statistical analysis was conducted.

Results: The syphilis antibody screening positive rate of Lanzhou 299969 blood donors were 0.59%, rejects in blood donors of different degrees of education, ages, genders, careers, marriage and nationalities had the statistical significance; rejects in blood donors of different degrees of education, ages, careers and nationalities had no statistical significance between Lanzhou city and the three blood stations in the province.

Summary/Conclusions: Blood donors in Gansu province, the degree high, 18–30 years old, students, staff, Han population is the key of the province to recruit security fixes blood donors; we will carry out syphilis antibody joint screening strategy and discuss Gansu province syphilis reactive donors reentry strategy in our province.

P-258
STUDY ON THE APPLICATION OF ELISA INTERNAL QUALITY CONTROL IN RANDOM WELL
Nanjing Red Cross Blood Center, Nanjing, China

Background: Enzyme-linked immunosorbent assay (ELISA) is affected by many factors, such as application of sample, incubation, washing and so on. The results would be different if a sample was tested in different well of a microplate.

Aims: To explore the value of testing ELISA internal quality control (IQC) in random well by comparing the results of IQC in random well with ifs in fixed wells.

Methods: HBsAg, anti-HCV, anti-HIV/HIV P24 and anti-TP were tested by ELISA in Nanjing Red Cross Blood Center laboratory. IQC in fixed and random wells were tested parallel in blood donor screening. The fixed well of positive IQC was in the position of well F1 in HBsAg, anti-HIV and anti-TP tests, and well G1 in anti-HCV and HIV P24 tests. The fixed well of negative IQC was in the position of well H1 in the tests above. The position of random well was derived by function f(x) = RAND(0, 1) * 81 from Excel after rounding to the nearest integer.

Results: There were no significant difference (P ≥ 0.05) by comparing the results of negative IQC in random wells and fixed wells in all the tests expect anti-TP (P < 0.05). Although the difference were statistically in anti-TP negative IQC test, all the results in random wells and fixed wells were negative. The difference were statistically significant (P < 0.05) between the results of positive IQC in random wells and fixed wells in anti-HIV, HIV P24 and anti-TP tests.

Summary/Conclusions: The value of testing ELISA negative IQC in random well was negligible. However, it should be adopted that testing positive IQC by ELISA in random well.

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P-259
INCIDENCE OF HEPATITIS B AND C VIRUSES AMONG BLOOD DONORS OF A TEACHING HOSPITAL IN MIRPUR, AZAD JAMMU KASHMIR, PAKISTAN
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Background: Access to safe blood and blood products still remains a major challenge throughout the world. Unsafe blood transfusion is very costly from economic point of view. The situation in Pakistan is not different where Transfusion-Transmitted Infections (TTIs) continue to threaten the blood safety. Blood-borne transmission remains a key vector of the Hepatitis B and C in Pakistan, affecting about 7.4 percent of the population. The Blood Transfusion sector in Pakistan is passing through a system reformation from a fragmented network of blood banks to a centralized network of Regional Blood Centres. However, the pre-reform Blood Transfusion Services in Pakistan are mostly hospital based with no functional separation of the process into independent establishments for ‘production’ and ‘utilization’.

Aims: The objective of the current study was to figure out the incidence of HBV and HCV in Mirpur, Azad Jammu & Kashmir (AJ&K), Pakistan.

Methods: This was a retrospective cross-sectional study conducted at the Divisional Headquarters Teaching Hospital, Mirpur, AJ&K, which is providing quality health services since 1966. All the blood donors [10,460] who donated blood from January 2015 to December 2016 were included in the study. All the donations were screened for Hepatitis B surface antigen, anti-HCV antibodies, and anti-HIV antibodies with ELISA.

Results: Out of 10,460 blood donors, 98% were replacement while 2% were voluntary non-renumerated blood donors (no paid/professional donor). A total of 848 donations (8.1%) were found positive for at least one of the infections. The prevalence of HCV and HBV was found to be 499 (4.77%) and 349 (3.33%) respectively.

No case of HIV was reported during the study period. The prevalence of HBV is comparable to previous studies in other parts of the country but HCV prevalence has shown a dramatic increase when compared with figures already reported and needs special attention. This data also suggests that HIV prevalence is infrequent.

Summary/Conclusions: The frequency of HBV is comparatively low. This might be due to vaccination programs and increased public health awareness. The best approach to minimize these TTIs is to have a careful donor selection and mandatory screening.

P-260
CONFIRMATION ANALYSIS OF HBsAg SCREENING REACTIVE RESULTS FOR VOLUNTARY BLOOD DONORS IN CHANGCHUN
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Background: Blood services in China to reduce blood transfusion infection after the residual risk of hepatitis b virus (HBV), screening reagents with high sensitivity, have a certain degree of false positive test results, which might cause the loss of voluntary blood donors, so it should be evaluated through the experimental study to establish a mechanism for the blood donors back.

Aims: To analyze the test results of ELISA method for the detection of HBsAg reactive specimens in ChangChun area, and evaluate the rejoined mechanism of blood donor and blood safety.

Methods: From December 2013 to August 2014, 307 HBsAg ELISA reactivity samples were routinely screened in the blood center of Jilin province, screening reagents are BIo-RAD hepatitis b virus surface antigen diagnostic kit (ELISA) and Shanghai Kelma hepatitis b virus surface antigen diagnosis kit (ELISA), confirm test for specimens were done by Zhuhai LiZhu hepatitis b virus surface antigen diagnosis kit (ELISA) and Zhuhai LiZhu hepatitis b virus surface antigen diagnosis kit (neutralization test).

Results: Seventy-one positive cases are confirmed after 307 HBsAg ELISA reactive specimen neutralization tests, the positive rate was 23.13%, among them, 98 cases of ELISA two types of reagents were confirmed positive, and the positive rate was 68.37%. Among 209 single-reactant ELISA specimens, 4 positive cases are confirmed, positive rate of 1.91%; difference of confirmatory test between two types of reagent and single reagent is statistically significant (P < 0.05). In the ELISA two type reagent reagents samples, S/CO ≥ 4.0, 82 cases in total; positive cases are 58, positive rate is 70.73%; S/CO between 1 and 5 is 16, positive cases are 9, positive rate is 56.25%, the difference is not statistically significant (P > 0.05). Among the 4
positive cases of the reagent of ELISA single reagent, one of them was the ELISA single reagent grey zone.

Methods: Based on a mathematical processing model, the last digit of current minutes time (m) and the last digit of current seconds time (s) were used to generate a random number, which was used to make changes on positions with time during the quality control sampling process. Then we designed a correspondent computer program and performed a test run in Hamilton MicroLab Star liquid handler. We analyzed the distribution feature of random positions being selected over 160 independent run in 71 days.

Results: In the mathematical model, m was first converted to ASCII code, and then multiplied by 10. The obtained number plus the value of ASCII code of ‘s’ to generate a time-based random number, denoted as ‘a’. The above process was successfully completed under MicroLab Star programming. In the MicroLab Star internal programming language, we called a function named as MthR01Draw(), which is a random number generator, for ‘a’ times. The obtained number multiplied by 10. The obtained number plus the value of ASCII code of ‘s’ to generate a time-based random number, denoted as ‘a’. The above process was successfully completed under MicroLab Star programming. In the MicroLab Star internal programming language, we called a function named as MthR01Draw(), which is a random number generator, for ‘a’ times. The obtained number multiplied by 10. The obtained number plus the value of ASCII code of ‘s’ to generate a time-based random number, denoted as ‘a’.

Summary/Conclusions: Random placement of quality control sample in a plate more closely simulates an actual donor sample’s conditions. The method used in this study was successfully completed under MicroLab Star programming. In the MicroLab Star internal programming language, we called a function named as MthR01Draw(), which is a random number generator, for ‘a’ times. The obtained number multiplied by 10. The obtained number plus the value of ASCII code of ‘s’ to generate a time-based random number, denoted as ‘a’.
Methods: 642 donations were screened individually for some TTI, namely; HIV, HBV and HCV by serology and nucleic acid testing (NAT). All reactive samples were retested (wherever possible). The reactive results of either serology or NAT were followed up, blood units were discarded and donors were notified and counselled.

Results: We evaluated 32 (4.98%) cases which were reactive on both NAT and Serology. 28 (4.36%) cases were detected on NAT (1.1% HIV, 0.16% HBV, 0.16% HCV). 4 (0.62%) cases were however reactive on serology and Non detected on NAT (0.16% HIV, 0.31% HBV and 0.16% HCV).

Summary/Conclusions: Our study indicated that it is important to use both NAT and serology to improve on the blood safety, a practice which is not yet embraced at Uganda Blood Transfusion Service. Screening of blood for TTI using Serology alone is associated with high rate of false positive and increased donor deferral.

Results: 30835 samples were tested, screening positive rate of 0.04% (11/30835). Of which five blood donors have many blood donation experience, suspected asymp- tomatic infection.

Summary/Conclusions: Huzhou area is not an endemic area of HTLV infection, but the risk of infection has increased the number of suspected blood donors, so it is necessary to carry out HTLV screening in blood donors.

P-268

Abstract has been withdrawn

P-266

BLOOD MANAGEMENT AND BLOOD SAFETY FOR MULTI-
TRANSFUSED THALASSEMAIA PATIENTS IN A STAND ALONE 
BLOOD BANK

A Verma

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Background: Transfusion Transmitted Infection (TTI) and alloimmunization are two major problems in multi-transfused patients.

Aims: This study is aimed to estimate the prevalence of blood TTI and presence of red cell antibodies in multiple blood transfused patients of beta thalassemia major who are taking blood from Rotary blood bank, New Delhi.

Methods: There are 106 Thalassemia Major patients registered with Rotary blood bank, New Delhi, India. All the patients are provided blood without taking any replacement donor and without taking processing charges. This is in accordance with our National guidelines. Rotary blood bank collects blood from 100% voluntary donors. The study was also conducted to know the extent of problem of alloimmunization and to find important red cell antibodies in thalassemia patients. All 106 thalassemia patients were screened. The samples were subjected to red cell alloantibody and autoantibody detection by column gel agglutination technique and by SPRCA. Three cell panel and then 11 cell panel reagent cells were used in screening and identification of alloantibodies respectively.

Results: Out of 106 multiple blood transfused patients – 33% patients were infected with TTI on serological test. Total 93 male patients and 13 female patients were infected with TTI. The sero-reactivity for HIV was 2.83% (03/106); 02/106 were males and 01/106 were females. The seroreactivity for HBsAg was 16% (12/106) were males and females 5/106, HBcAb 2.83% (3/106) The sero-reactivity for HCV was 20.75% (22/106); (17/106) were males and 5/106 were females. Out of 106 patients 15 (14%) subjects were alloimmunized. All alloimmunized subjects were recipient of more than 20 units of transfusion. Total nine clinically significant alloantibodies were identified. Anti E and anti c were commonest antibodies in 60% patients.

Summary/Conclusions: HIV, HBV, HCV infections are most prevalent TTI among multi-transfused thalassemia patients. Red cell alloimmunization is another risk in these patients so to prevent it extended phenotype matched blood transfusion for Rh-c, and Rh-E antigens should be given.

P-269

VERIFICATION PROCEDURE OF HBsAg ELISA IN BLOOD SCREENING

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Background: To ensure the safety of donated blood, the performance of ELISA is pivotal for laboratory results and should be under effective control. Therefore, the verification of ELISA reagents is an indispensable part for screening laboratory in blood centers.

Aims: To verify the blood screening reagent and guarantee the blood safety, we comprehensively evaluated the performance of candidate HBsAg ELISA in this study.

Methods: Standard materials and real samples were simultaneously tested by current-used reagents as well as candidate reagent, and the results were compared to illuminate the qualification of the candidate, both in lab compatibility and concordance with the background testing.

Results: The repeatability and accuracy of the candidate HBsAg ELISA met the lab requirements. As compared with other two current-used ELISA, the concordance of the candidate was 100%.

Summary/Conclusions: As the final user, our department implemented the verification of test to ensure the integrity and validity of blood screening. In this study, the candidate passed the verification with good specificity and sensitivity.

P-270

DISCUSSION ON THE METHOD OF PERFORMANCE COMPARISON OF NUCLEIC ACID DETECTION SYSTEM

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Background: “Technical operation of procedures in blood bank” provides that the detection of the same project between the different systems need to compare performance, the current our center has three sets of nucleic acid detection system, in order to clearly understand the detection performance of the system and the differences between systems, we explore the methods of Detection system performance comparison.

Aims: To explore the nucleic acid detection system performance comparison methods and indicators, by comparing the performance of nucleic acid detection system, found the differences what between the various systems to ensure the test results accurate and reliable.

Methods: In the same test environment detect the same samples, the same reference substance and the same serum plate by different systems to statistical analysis the sensitivity, specificity, repeatability and coincidence of each system for comparing the performance and suitability of each system.

Results: Two systems which HuaYiMei detection system and GRIFOLS detection system serum plate evaluate what specificity and sensitivity was 3 projects of 100%. Kelhua system the specificity of the project was 100%, the sensitivity of HBV-DNA project was 100%, the sensitivity of HCV-RNA project was 92.9%, the sensitivity of HIV-RNA project was 90.9%. The coincidence rate what parallel detection of HuaYiMei and GRIFOLS system was 99.93%, KelHua and GRIFOLS system was 99.94%, Kelhua and HuaYiMei system was 99.91%. There was no statistical differences in the pool detection positive rate and the single detection positive rate of two kinds of pool detection system that Kelhua and HuaYiMei by x^2 test.

Summary/Conclusions: Explore establishing the system what performance comparison of nucleic acid detection system for comparison the nucleic acid detection system performance in future. Through comparatives analysis to prove that there was
no significant difference between the three nucleic acid detection systems, to facilitate the daily detection arrangements, and the detection system can be a backup between each other, to ensure the detection conduct smooth and blood safety.

P-271
SEROPREVALENCES AND TITER OF HUMAN NEUTRALIZING ANTIBODIES AGAINST DIFFERENT TYPES OF ADENOVIRUS DETECTED IN PLASMA
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Background: Human adenovirus (HAadV) had caused several outbreaks of acute respiratory infections all over the world in recent years. In Southern China, the main genotype of HAadVs include HAadV-3,-4,-7,-14,-55. By detecting the positive rates and titers of human neutralizing antibodies (NAbs) against different types of adenovirus, the history of infection and the protective immunity against specific adenovirus types could be understood.

Aims: To investigate the positive rates and titers of human neutralizing antibodies against HAadV-3,-4,-7,-14, and -55 in Guangzhou area and provide data for adenovirus vaccine development as well as guide for the selection of appropriate immune population and optimal immune time.

Methods: Plasma samples from 270 healthy donors in Guangzhou Blood Center were collected and tested by in vitro micro-neutralization assay, the seroprevalences and titers against HAadV-3, -4, -7, -14 and -55 were analyzed. Results: Of the 270 plasma samples from blood donors, the seroprevalences of NAbs against HAadV-3,-4,-7,-14 and -55 were 47.78%, 41.48%, 47.41%, 40.74% and 38.15% respectively; the proportions with medium-high titer NAbs (128-1152) were 11.48%, 3.33%, 9.26%, 12.22% and 4.07% respectively; the proportions with high titer 21152 were 7.78%, 27.61%, 8.52%, 4.81% and 14.64% respectively. The positive rates of NAbs against HAadV-7 and -55 increased with age, and there was no significant difference in the proportions of NAbs against all HAadVs between male and female.

Summary/Conclusions: There are similarly seroprevalences of NAbs against HAadV-3,-4,-7,-14 and -55 in blood donors representing general adults in Guangzhou area. More medium-high titer of NAbs against HAadV-3, -7 and -14 were found than HAadV type 4 and 55, While there are a lack of high titer protective antibodies against HAadV-3, -7 and -14.

P-272
APPLICATION OF NUCLEIC ACID TESTING (NAT) TECHNOLOGY FOR BLOOD SCREENING IN INNER MONGOLIA BLOOD CENTER
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Background: Transfusion of blood products can help save millions of lives. However, as the demand for blood and blood products increases year by year, many countries face severe challenges of blood, quality of blood products and safety. The world health organization recommends mandatory screening of HIV, hepatitis b, hepatitis c, and some other viruses in blood donors. The need to have the national overall Nucleic Acid blood screening Test (Nucleic Acid Test, NAT).Nucleic acid detection as the latest generation of detection technology, direct detection of pathogens of DNA or RNA, therefore has higher sensitivity and specificity, hepatitis b, hepatitis c, HIV/AIDS can be significantly shorten the “window period”. This experiment through a year of unpaid donors specimens simultaneously twice enzyme to avoid detection and virus nucleic acid detection, again. The results from the nucleic acid testing were analyzed compared with those from ELISA. The ELISA experiment was based on the same 2430/2420 automatic enzyme-linked reaction system and the Swiss automatic sample system STAR. NAT uses the American Novartis automatic blood virus nucleic acid detector (Prolex TGISR System).

Results: Among all the test results, the positive rate of ELISA detection than NAT. At the same time there is the certain percentage of ELISA+/–NAT(+). Especially since I center for nucleic acid detection has been successfully captured an AIDS window period infected blood donors, to ensure the quality, to ensure the safety of the blood recipients have played a very important role, but also strongly confirmed to carry out the necessity of nucleic acid detection.

Summary/Conclusions: It can be seen that currently, the two methods of blood screening ELISA and NAT complement each other, which must be adopted simultaneously, which is of great significance to prevent the infection of the recipient “window period”. Novartis TGISR system of NAT is appropriate for screening the virus of the donors’ blood.

P-273
CONTENT DETERMINATION OF GRANULOCYTIC MYELOID-DERIVED SUPPRESSOR CELLS AND ITS CORRELATION WITH HBV DNA LEVEL
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Background: Myeloid-derived suppressor cells (MDSCs) is a group of novel immunosuppressive cells which can be divided into two types as granulocytic-MDSC (G-MDSC) and monocytic-MDSC (M-MDSC). MDSC can suppress both adaptive and innate immune. In combination with the immunosuppressive status of chronic hepatitis B virus (HBV) infection, as well as the strong immune suppression function of MDSC in acute and chronic inflammation, tumor and other pathological conditions, we hypothesized that MDSC may also be involved in immunosuppression during HBV infection.

Aims: We collected 77 blood donors with different HBV infected status, and studied the content of G-MDSC, markers related to liver function, hepatitis B surface antigen (HBsAg) and HBV DNA, in order to investigate the numbers of G-MDSC and weather it mediated HBV immune suppression in varied HBV infected status thus to provide a theoretical basis and clues for the novel treatment for hepatitis B.

Methods: ALL 77 HBV infected donors were divided into 3 groups according to the varied HBV infection status, including 31 cases of occult HBV infection (OBI) with HBSAg+/HBV DNA-, 36 cases of inactive HBV infection (IHI) with HBSAg+/HBeAg-/HBV DNA- and 10 cases of active HBV infection (AHI) with HBSAg+/HBeAg+/HBV DNA+. Lymphocytes were isolated from fresh peripheral blood and G-MDSC and M-MDSC were counted and sorted by Flow cytometry. The content of G-MDSC and M-MDSC are negatively related with HBV DNA level, the r value was –0.492 (P = 0.003) in IHI group and –0.617 (P = 0.025) in AHI group, however, the correlation had no statistical difference between these two groups. Neither statistically significant correlation was observed between G-MDSC and age, AST, ALT and HBsAg.

Summary/Conclusions: The content of G-MDSC was negatively correlated with HBV DNA level, which suggested G-MDSC involved in HBV immune suppression but played a different role with M-MDSC (data not shown) in the immune process of HBV infection.

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Hepatitis B (HBV)
P-274
PRE-S/MUTATIONS OF OCCULT HEPATITIS B VIRUS FROM BLOOD DONORS WITH OR WITHOUT ANTI-HBS

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Background: Occult hepatitis B virus infection ([OBI] with genotype B or C strains [OBiB or OBiC] has not been characterized for pre-S/Mutation with anti-HBs status of OBI carriers.

Aims: To better understand pre-S/Mutations of OBIIs that associated with antibody pressure elicited by vaccination or host immune response to HBV.

Methods: The molecular characteristics of envelope protein mutations was extensively analyzed in corresponding to anti-HBs seromarkers of OBI carriers.

Results: 99 HBsAg-/DNA+ blood donors were identified as OBIIs from 310,167 blood donors in Shenzhen blood center, yielding the rate 1:3133. OBIB was predominant in 2/78 samples, including 22 OBIs (12 genotype B and 10 genotype C) and 5 WP samples (3 genotype B and 2 genotype C) of the 22 OBIs, 12 were adw subtype, 7 were adw subtype, 1 was varied to aw subtype and 2 had unknown changes. S protein mutations were identified in 18 of the 22 OBI samples with relatively high frequencies of Q101R/L, E2G/D, A5S/V. Pre-S/S mutations were detected at 32-50% of 12 OBIs, by stratifying OBI carriers with anti-HBs seromarkers, the frequency of pre-S/S mutations was even higher in anti-HBs- than that in anti-HBs+ OBI carrier. The mutations psT68I, psK122R and psQ129R were found uniquely in 5% of OBI donors in Shenzhen blood center, yielding the rate 1:3133. OBIB was predominant in 2/78 samples, including 22 OBIs (12 genotype B and 10 genotype C) and 5 WP samples (3 genotype B and 2 genotype C) of the 22 OBIs, 12 were adw subtype, 7 were adw subtype, 1 was varied to aw subtype and 2 had unknown changes. S protein mutations were identified in 18 of the 22 OBI samples with relatively high frequencies of Q101R/L, E2G/D, A5S/V.

Summary/Conclusions: We found that all the HbsAg-negative HBV infection blood donation were genotype B and C in Shanghai. Most of them were OBIIs with extremely low HBV DNA loads and a small number were WP infections. Amino acid substitution in S protein and nucleotide replacement in PCP region may be important mechanisms for the occurrence of OBI in these carriers infected with genotype B and genotype C HBV.

P-275
SEROLOGICAL AND MOLECULAR CHARACTERIZATION OF HBsAG-NEGATIVE HEPATITIS B VIRUS INFECTION IN BLOOD DONORS

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Background: Hepatitis B (HBV) infection is the most important factor causing hepatitis, liver cirrhosis and hepatocellular carcinoma, HBV infections over 350 million people worldwide and the prevalence of hepatitis B surface antigen (HBsAg) is as high as 7.18% in Chinese population. Pre-conversion window period (WP) infection and occult HBV infection (OBI) are characterized by the presence of HBV DNA in plasma with undetectable HBsAg using the most sensitive commercial assays, which is a potential risk of HBV transmission through blood transfusion after HBsAg screening. Nuclear acid testing (NAT) for HBV, HCV and HIV has been used in blood donors to potential risk of HBV transmission through blood transfusion after HBsAg screening. With undetectable HBsAg using the most sensitive commercial assays, which is a potential risk of HBV transmission through blood transfusion after HBsAg screening.

Aims: To investigate the serological and molecular characterization of HBsAg-negative HBV infections from blood donors in Shanghai, China.

Methods: Blood donor samples confirmed HBsAg negative and HBV DNA positive were collected by Shanghai blood center. Serum anti-HBc and anti-HBs were tested by enzyme-linked immunosorbent assay (ELISA). HBV DNA loads were determined by Roche COBASAmpliPrep/COBAS TaqScreen HBV Test v1.0. HBV S and BCP/PC regions were amplified using nest-PCRs and products were cloned in the TA cloning vector for sequencing. Nucleotide sequences were translated into amino acid sequences according to the open-reading frames by DNAMAN software and HBsAg serologic subtypes were predicted from the amino acid sequences at position 122 and 160. HBV genotypes were determined by Blast in Genbank. S protein and BCP/PC gene mutations were determined by comparison with wild-type HBV sequences in Genbank database.

Results: A total of 78 samples confirmed HBsAg negative and HBV DNA positive were collected, of which 70 samples with anti-HBc and/or anti-HBs positive were classified as OBI and 8 seronegative samples were classified as window period (WP). There were 23 samples positive for anti-HBs and 18 were weakly reactive for anti-HBs (<100 IU/L). HBV DNA loads of all 70 OBI samples were <200 IU/mL and lower than those of WP samples significantly (P < 0.01). S regions were amplified in 27/78 samples, including 22 OBIs (12 genotype B and 10 genotype C) and 5 WP samples (3 genotype B and 2 genotype C) of the 22 OBIs, 12 were adw subtype, 7 were adw subtype, 1 was varied to aw subtype and 2 had unknown changes. S protein mutations were identified in 18 of the 22 OBI samples with relatively high frequencies of G101R/L, E2G/D, A5S/V. Pre-S/S mutations were detected at 32-50% of 12 OBIs, by stratifying OBI carriers with anti-HBs seromarkers, the frequency of pre-S/S mutations was even higher in anti-HBs- than that in anti-HBs+ OBI carrier. The mutations psT68I, psK122R and psQ129R were found uniquely in 5% of OBI donors in Shenzhen blood center, yielding the rate 1:3133. OBIB was predominant in 2/78 samples, including 22 OBIs (12 genotype B and 10 genotype C) and 5 WP samples (3 genotype B and 2 genotype C) of the 22 OBIs, 12 were adw subtype, 7 were adw subtype, 1 was varied to aw subtype and 2 had unknown changes. S protein mutations were identified in 18 of the 22 OBI samples with relatively high frequencies of G101R/L, E2G/D, A5S/V.

Summary/Conclusions: We found that all the HbsAg-negative HBV infection blood donation were genotype B and C in Shanghai. Most of them were OBIIs with extremely low HBV DNA loads and a small number were WP infections. Amino acid substitution in S protein and nucleotide replacement in PCP region may be important mechanisms for the occurrence of OBI in these carriers infected with genotype B and genotype C HBV.

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sample from H+R was 14 IU/mL by Abbott i2000 (undetected by HBV2.0), and 6 times the LOD of MFX2.0, these results above indicated that there was something special. These samples matrix to HBV is another determinant of the sequence mutations may appear resulting in missing detection. However, we didn’t know the exact region that these reagents target, we could not explore it further.

Summary/Conclusions: Although MFX2.0 and Haoyuan are two mainly used NAT screening reagents with good performance on daily work in blood banks in China, we found in this study that the two reagents still suffered missing detection of HBV DNA. Low viral load may be a main and important reason, besides reasons from samples themselves, such as matrix or HBV DNA sequence may also lead to false-negatives.

P-277
VARIATION OF MAJOR HYDROPHILIC REGION AND “A” DETERMINANT OF HBV IN HCV/OBI CO-INFECTED PATIENTS
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Background: Occult hepatitis B virus infection is defined by the presence of HBV DNA in the absence of detectable HBsAg in serum. The mechanisms leading to OBI infection has not yet been researched clearly. Mutations in major hydrophilic region (MHR) and “a” antigenic determinant of the surface antigen was one of the earliest recognized mechanisms leading to occult HBV infection. In HCV/HBV coinfection patients, HCV’s inhibition to HBV is another determinant of OBI. The HCV core gene can inhibit HBV replication and gene expression and suppress activity of HBV enhancers. Coinfection with OBI among patients with chronic HCV infection was found in 30% of patients in Italy and up to 80% in Japan.

Aims: To investigate the prevalence of OBI in chronic HCV infected patients in blood donors and drug addict. Elucidate the mechanism of OBI in HCV/OBI co-infected patients.

Methods: TIGRIS high sensitivity nucleic acid test system was used to screen HBV DNA among patients with chronic hepatitis C (anti-HCV, HBV DNA+; HBsAg-). The positive rate of OBI among HCV infected patients from Guangzhou blood center and 193 of them from Yangjiang prison drug addicts. HBV-DNA detection by PCR was performed using primers specific for the S region of the HBV genome. The surface gene sequence of HBV/OBI co-infected patients was analyzed and compared with 9 wild type HBV and 12 OBI.

Results: Occult HBV DNA were found in the serum of 12 of 279 (4.3%) HCV infected patients, absence of HBsAg in followed-up specimens, excluding HBV window infection. The positive rate of OBI among HCV blood donors and drug addicts is 5.8% (5/86) and 3.6% (7/193). No significant difference in the positive rate of OBI were observed in these two groups (P > 0.05). No significant difference were found in age and gender between the HCV/OBI co-infected patients and HCV infected patients (P > 0.05). Two HBV S region (genotypes B) were amplified in 12 HCV/OBI co-infector. The MHR amino acid substitution rate [amino acid variance/total amino acid] of HCV/OBI: HBV and OBI was 4.2% (5/118) × 0.8% (4/511) and 2.8% (20/708), the “a” determinant amino acid substitution rate was 1.39% (3/216) × 1.38% (2/148) and 4.17% (2/48). The rate of MHR amino acid replacement of HBV/OBI and OBI group (P > 0.05). There was no statistical difference in the rate of amino acid replacement in “a” determinant.

Summary/Conclusions: In our experimental conditions, the prevalence of occult HBV co-infection among patients with chronic hepatitis C is higher than blood donors (106/47538, 0.22%) (Wang, R, Z, BMC, Infect, Dis, 2016). Occult HBV co-infection with HCV was associated with mutations in the MHR of HBV.

P-278
Abstract has been withdrawn

P-279
A RECOMBINANT TRUNCATED HEPATITIS B CORE ANTIGEN (HBCAG) AS VACCINE COULD EXERT THE PROPHYLACTIC AND THERAPEUTIC FUNCTION IN A MOUSE MODEL MIMICKING HEPATITIS B VIRUS INFECTION
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Background: Chronic Hepatitis B virus (HBV) infection remains a world-wide health problem, as no therapy available such as IFN-α, nucleos(t)ide analogs, could eliminate the cccDNA [covalent closed circular DNA] of the virus from infected hepatocytes.

Aims: Vaccination of therapeutic vaccine, stimulating the host immune response to control virus infection, is the most convenient method to solved the problem.

Methods: As the immunogenicity of HBcAg elucidated in previous reports, our study devised a recombinant fusion protein containing a truncated HBcAg and a moiety with binding function, core streptavidin (cSA), termed HBcAg-cSA. This fusion protein was expressed in large amount in Escherichia coli, after purification and renaturation, the moiety of the fusion protein could bind to biotin and form large complex. The fusion protein mixed with adjuvant polyIC as vaccine formulation, vaccinated subcutaneously into C57BL/6 mice before or after hydrodynamic tail vein injected with pAAV-HBV-G01.3 replicon to mimic virus infection.

Results: The HBcAg and HBsAg level of the vaccinated group significantly reduced compared with control group.

Summary/Conclusions: In conclusion, this vaccine formulation containing recombinant truncated HBcAg exert both prophylactic and therapeutic function in the mouse model mimicking HBV infection.

P-280
Abstract has been withdrawn

P-281
PRECISION TRANSFUSION MEDICINE BY COMBINING GENOTYPING AND NAT SCREENING WITH AGENA MASSARRAY 4 PLATFORM
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Background: Recent advances in nucleic acid [genetic] tests have let to the possibility of using a single nucleic acid test platform with high PCR multiplicity and throughput for the blood genotyping as well as the screening for transfusion transmitted diseases in the donors. Typically, a blood center in China operates two sets of labs: one based on immunology and serology techniques for blood typing and chemiluminescence immunoassays for infectious diseases; and the other based on the NAT (nucleic acid amplification test) techniques for infectious diseases. A NAT test is mandatory because it can detect traces amount of the DNA or RNA of the infectious agents before typical seroconversions can be detected in a donor’s blood and thus represents a smaller time window of accidental inoculating infectious agents into transfusion recipients.

Aims: The aims of this study are to explore the possibility of developing a new multiplexed PCR technique based on the MassArray® NAT platform and to combine it with the blood genotyping panels such that a single instrument might allow safe and precision transfusion medicine for transfusion and cell therapies.

Methods: We tested over 200 blood donor samples for HBV using the MassArray® NAT platform, which is based on MALDI-TOF analysis of the PCR products. We compared the NAT test results with those of the serologic and biochemical features of the samples that were found to contain only HBV DNA and performed threshold measurements.

Results: We identified those donors who were weakly positive for HBV in the serologic and biochemical tests were all confirmed with positive HBV DNA test using the MassArray® platform.

Summary/Conclusions: Our tests indicated that the Agena MassArray 4 NAT test platform is a highly sensitive and specific NAT method that can perform both blood genotyping panels and infectious disease screening of the donor. The method is simple, high throughput and fluorescence contamination free.

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PREVALENCE OF HBV NAT REACTIVITY AMONG 6.5 MILLION SERONEGATIVE BLOOD DONATIONS BY COBAS® TAQSCREEN MPX TEST, V2.0 IN CHINA FROM 2015 TO 2016

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Background: Since 2010, blood banks in China have gradually begun to perform nucleic acid test (NAT) screening for Hepatitis B Virus (HBV) DNA, and Hepatitis C Virus (HCV) RNA, Human Immunodeficiency Virus (HIV) RNA according to the recommendations set by the National Health and Family Planning Commission of China. Several different manufacturers’ assays are used for NAT testing in China. In 2015 and 2016, more than 30% of the blood donations were tested by cobas® TaqScreen MPX Test, version 2.0 for use on the cobas® 2.0 system by Roche Molecular Systems (MPX2.0), which is a qualitative multiplex test that simultaneously detects HIV, HBV, and HCV.

Aims: As China is a highly endemic area for HBV infection, the aim of this study was to analyze the prevalence, trend, and distribution of HBV NAT positive-seronegative blood donations by MPX2.0 in China for 2015 and 2016.

Methods: All the blood donations were first detected by two different ELISAs for HBV surface antigen (HBsAg), anti-HCV and anti-HIV and all seronegative donations were then screened by NAT. NAT screening with MPX2.0 was initially tested in mpools (MP) of 6 donation and reactive minipools were further tested by individual donation testing (IDT) to determine which donation(s) was reactive for a viral target. We collected NAT data from all blood banks in China from 2015 to 2016 and analyzed the prevalence of HBV DNA among seronegative blood donations that were screened by MPX2.0.

Results: 33.8% [6,522,333/19,277,036] of seronegative blood donations, from 21 provinces in China, were screened by MPX2.0 from 2015 to 2016; the average frequency of HBV DNA among seronegative blood donations was 1/868, which was slightly higher than the average level of 1/1083 in China. From the results, 10,078 MP were NAT reactive for HBV. 97.6% (9836/10078) of MP were HBV DNA reactive, slightly higher than the average level of 1/1083 in China. From the results, 10,078 of HBV DNA among seronegative blood donations that were screened by MPX2.0.

Summary/Conclusions: Our study indicated that more vaccine dose, supplemental strengthening immunity might be emphasized in male populations.

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SEX DIFFERENCE IN HBsAg SPECIFIC ANTIBODY RESPONSE AMONG HEPATITIS B VACCINE IMMUNIZED POPULATIONS

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Background: Hepatitis B virus infection has been a worldwide health problem. Hepatitis B virus vaccination is still regarded as the most economical and effective method for prevention and control of HBV infection. It seems to be that there is sex-difference in immune response to Hepatitis B vaccine in humans.

Aims: Due to this limited data, it is mandatory to assess sex-differences which might have clinical implications. This study aimed to conduct a systematic review and meta-analysis to assess a more precise estimation of sexual dimorphism of immune development and persistence to hepatitis B vaccine in humans.

Methods: HBV vaccination or anti-HBs or anti-HBs antibody and sexual dimorphism or sex-difference and antibody response combinations were used as medical subject headings for the searches. Total antibody concentrations were analyzed using mean difference with fixed-effects model for a low heterogeneity and random model for a high heterogeneity. And rates of antibody concentration of more than 100, response rates and total positive rates were evaluated using odds ratios (OR) with fixed-effects model or random model. Both fixed-effect model and random-effect model were used in meta-analysis analysis. Our included studies examined seroprotection rates, anti-HBs mean geometric titers (GMTs), and anamnestic response with hepatitis B vaccine in male and female populations.

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Results: This meta-analysis including 22,863 females and 19,852 males in 42 articles showed that a significantly decreased response to hepatitis B vaccine appeared in males seroprotection rates (OR = 0.75; 95% CI, 0.61 to 0.93; P = 0.007); anti-HBs mean geometric titers (GMTs) (MD = 14.25; 95% CI, 15.04 to 13.47; P < 0.00001) with hepatitis B vaccine.

Summary/Conclusions: Our study indicated that more vaccine dose, supplemental strengthening immunity might be emphasized in male populations.

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ANALYSIS OF HBV INFECTION AND RISK FACTORS AMONG LI MINORITY IN HAINAN

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Background: The infection rate of HBV in China is different in different regions, the lowest in the eastern region, the second in the central region, and the highest in the western region. In 1992, the national HBV epidemiological survey showed that the HBV infection rate in Hainan province was 84.7%, higher than the national standardized infection rate (78.2%) indicating that Hainan province is the high incidence area of HBV infection. In addition, the epidemiological survey also found that the HBsAg positive rate of Han population in Hainan province was significantly lower than that of ethnic minority. Li minority is the most important ethnic minority in Hainan Province, whose population is 88.4% of the total population of the minorities in Hainan.

Methods: A total of 1595 individuals of Li minority in Baisha county, Hainan Province were recruited by random sampling method from July 2014 to October 2015. Epidemiological data including baseline characteristics and risk factors were obtained. HBcAb was detected by chemiluminescence method. The difference on age between HBcAb positive and negative was analyzed by t test. The effects of age, gender and related risk factors on HBcAb were analyzed by univariate chi square test and multivariate logistic regression; P < 0.05 was considered statistically significant.

Results: The positive rate of HBcAb was 71.8% [1145/1595] and no significant difference between male and female was observed (x2 = 0.134, P = 0.715). The difference of HBV infection among age groups was statistically significant (F = 540.769, P < 0.001). The HBV infection rate was 11.9% in the 12–17 year group, which was significantly lower than that in all the other age groups. The HBV infection rate in the 18–23 year group (28.0%) was significantly higher than that in the 12–17 year group, but significantly lower than that in the other age groups (>85%). Multivariate logistic regression analysis showed that alcohol consumption and tattoo were independent risk factors associated with HBV infection (x2 = 165.833, P < 0.001; x2 = 11.354, P = 0.001).

Summary/Conclusions: The prevalence of HBV infection of Li minority in Baisha county, Hainan Province is 71.8%. Subjects of 12–17 years old showed the lowest infection rate, followed by that of 18–23 years old, and subjects over 23 years old presented high HBV infection rate. Alcohol consumption and tattoo were independent risk factors associated with HBV infection.

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ROLE OF HLA-DP GENES AND MRNA EXPRESSIONS ON SUSCEPTIBLE OF HEPATITIS B INFECTION

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Background: Hepatitis B virus (HBV) affects approximately 68 million people in China. 10–15% of patients with chronic HBV will develop liver cirrhosis (LC), liver failure and hepatocellular carcinoma (HCC). Chronic HBV infection is influenced by both viral and host factors. In genome-wide association studies (GWAS), the human leukocyte antigen complex (HLA) and HLA-DPB1 gene and their related
polymorphisms rs3077, rs2977534 and rs2977535 were identified to be associated with susceptibility to hepatitis B infection. HLA genes have been linked to immune response to infectious agents. Genetic variants in HLA genes influence HLA mRNA expression which might also affect antigen presentation and immune response.

Aims: We evaluated the association between HLA gene polymorphisms and the risk for susceptible HBV infection.

Methods: In this study, HLA-DPA1 and HLA-DPB1, rs3077, rs2977534 and rs2977535 polymorphisms were investigated in 168 chronic HBV patients and 217 healthy controls (HC) from Sichuan by using a sequence based typing. The HBV viral load and mRNA of HLA-DPA1 and HLA-DPB1 were measured by real-time polymerase chain reaction (RT-PCR).

Results: The results showed that HLA-DPA1, HLA-DPB1 gene, rs3077, rs2977534 and rs2977535 were all associated with HBV infection in the Sichuan Han populations. DPA1*01:03, DPA1*04:01 and DPB1*04:02 play a protected role in HBV infection, DPA1*02:02, DPB1*05:01 prone to susceptible to HBV infection. The HBV viral load was significantly lower in rs3077TT compared than rs3077CC, however, the HBV viral load have not association with rs2977534 and rs2977535. Additionally, the rs3077CT, rs3077TT, 544A/553AA have significantly lower HLA-DPB1 mRNA expression in HBV group compared that in HC group. DPA1*01:03 and DPB1*02:01 have a significantly higher HLA-DPA1 mRNA expression in HBV infection group compared than HC group. However, DPB1*04:01, DPB1*02:02 and DPB1*14:01 have a significantly higher HLA-DPB1 mRNA expression in HBV infection group compared than HC group.

Summary/Conclusions: It's the first time in our results demonstrate that HLA-DPA1 and DPB1 genes and rs3077C, rs9277534G and rs9277535G allele has a major effect on the HBV viral load have not association with rs3077CC and rs2977534 and rs2977535. The results shown that HLA-DPA1, HLA-DPB1 gene, rs3077, rs9277534 and rs9277535 were identified to be associated with susceptive HBV infection. We aimed to study the correlation of monocytic- and granulocytic-MDSCs (M-MDSC and G-MDSC) in peripheral blood mononuclear cells (PBMC) with HBV infection status of HBsAg negative/HBV DNA positive blood donors in Southwest of China.

Background: Monocytic- and granulocytic-MDSC (MDS) are a group of heterogeneous cells that have not fully differentiated and could suppress bone marrow-derived immune response. MDSCCs have been proved to inhibit T-cell responses in many diseases including hepatitis.

Aims: We aimed to study the correlation of monocytic- and granulocytic-MDSCs (M-MDSCs and G-MDSCs) in peripheral blood mononuclear cells (PBMC) with HBV infected patients and explored the clinical significance of each subset in these patients.

Methods: The study population composed of 31 chronic hepatitis B patients (CHB), 44 spontaneous responders (SR), 34 vaccinated donors (VD) and 22 seronegative donors. PBMCs were freshly isolated from whole blood by Ficoll centrifugation and MDSCs were immediately analyzed by flow cytometry (BD canto II) with the following anti-human antibodies: CD11b-FITC, CD33-PE, HLA-DR-PE/Cy5, CD14-PE/cy7, CD15-BV421. The levels of MDSCs between groups were compared by a non-parametric Mann-Whitney U test. Correlations between MDSC and other parameters were analyzed using Spearman’s rank test. Statistical analysis were performed using SPSS 16.0 and a P-value of less than 0.05 was considered to be statistically significant.

Results: We found that the frequencies of M-MDSCs and G-MDSCs from CHB patients were significantly increased when compared to seronegative donors (M-MDSC, 0.7% ± 0.6% vs 0.4% ± 0.2%, P = 0.015; G-MDSC, 0.9% ± 0.4% vs 0.7% ± 0.4%, P = 0.025) and VD or SR (data not shown). Besides, the level of MDSCs in PBMCs of CHB patients did not correlate with age, aspartate aminotransferase (AST), alanine aminotransferase (ALT), HBV viral load, serum HBAg titer or HBeAg status.

Summary/Conclusions: Both M-G-MDSCs and MDSs elevated in CHB patients, indicated a role of MDSc in the host immune response against HBV infection. Since the level of MDScs did not correlated with HBV DNA load, it appeared that the elevation of MDSCs associate with the immune response caused by the infection rather than the level of active viral replication.

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THE ESTABLISHMENT OF METHOD FOR PREPARATION OF ANTI-HBSAg IgG-BINDING BACTERIAL MAGNETIC NANOPARTICLES

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Background: Recently, new bacterial magnetic nanoparticles (BMPs) synthesized by magnetotactic bacteria have recently drawn great interest due to their unique features. BMPs are interesting as potential carriers for antibodies, enzymes, ligands, nucleic acids, and chemotherapeutic drugs.

Aims: In this study, we used BMPs as carriers of the monoclonal antibodies against HBsAg and prepared BMPs-antibody complexes for the detection of HBsAg.

Methods: BMPs-antibody complexes were prepared at weight ratio of 2:1 (BMPs to antibody) and then added to 0.01× phosphate buffer saline (PBS). Glutaraldehyde was added to a final concentration of 0.25% (V/V). The resulting mixtures were incubated at 25°C for 12 h, and then the desired product was collected as pellet by magnetic separation. Washing buffer (0.01× PBS) was added, and the washing treatment is repeated three times to remove unbound antibody and glutaraldehyde.

The conjugated antibodies were identified by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). The immunological characteristics of the BMPs-antibody complexes were verified by western blot, and the biological activity of antibodies on BMPs was analyzed by enzyme linked immunosorbent assay (ELISA).

Results: The results from SDS-PAGE showed that protein from BMPs and HBsAg IgG antibody complexes had the same band as the standard anti-HBsAg IgG antibody, however, magnetosome membrane protein of BMPs without binding anti-bodies lacked this band. Western blot and ELISA suggested that BMPs did not affect the biological activity of conjugated antibodies.

Summary/Conclusions: Anti-HBsAg IgG-binding BMPs obtained by this approach could be further applied for the detection of HBsAg.

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HBV INFECTION CHARACTERISTICS OF HBsAg-/HBV DNA+ BLOOD DONORS IN SOUTHWEST OF CHINA

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Background: The real infection status and characteristics of hepatitis B virus of HBsAg negative/HBV DNA positive blood donors is very important for improving blood screening strategy to guarantee blood safety but is difficult to clarify for which supplemental testing and follow-up study are needed.

Aims: To study the real infection status and characteristics of hepatitis B virus of HBsAg negative/HBV DNA positive blood donors in Southwest of China.

Methods: A total of 191 HBsAg-/HBV DNA+ blood donors from three blood centers in the southwest of China were included in this study. Epidemiological questionnaire survey and supplemental testing including high sensitive HBV DNA viral load testing and chemiluminescent immunoassay (CLIA) for HBsAg, anti-HBs, anti-HBc, HBeAg and anti-HBe were conducted. Donors’ infection status is defined by the follow-up study, of which some without follow-up was conducted according to the supplemental testing of the original samples. Some of the samples were tested for HBV DNA viral load for six or three times repeatedly to study the possibility of samples with low viral load missed by HBV DNA testing.

Results: Of the 191 donors included in this study, 64.40% (123/191) were male, 81.15% (155/191) were Han, 58.64% (112/191) were above 41 years old, 29.32% (56/191) were below high school education level, 64.92% (124/191) were married and 67.54% (128/191) were repeat donors. 78 donations (40.84%, 78/191) were negative for HBV DNA viral load for six or three times repeatedly to study the possibility of samples with low viral load missed by HBV DNA testing.

Results: Of the 191 donors included in this study, 64.40% (123/191) were male, 81.15% (155/191) were Han, 58.64% (112/191) were above 41 years old, 29.32% (56/191) were below high school education level, 64.92% (124/191) were married and 67.54% (128/191) were repeat donors. 78 donations (40.84%, 78/191) were negative for HBV DNA viral load for six or three times repeatedly to study the possibility of samples with low viral load missed by HBV DNA testing.
very low which may result in the false negative results of HBV DNA testing. Thus, it’s very important to improve the HBV DNA assays or adopt repeat HBV DNA testing to increase the rate of detection of OBI donations so as to decrease transfusion transmitted HBV infection by OBI donations.

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SCREENING AND MOLECULAR BIOLOGY RESEARCH ON BLOOD DONORS OF OCCULT HBV INFECTION
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Background: Occult Hepatitis B Virus infection (OBI), a special Hepatitis B Virus infection, which could not easily be detected by conventional ELISA and chemiluminescence method but can be identified by nucleic acid detection characterized by low level of HBV DNA expression, can cause residual risk of HBV.

Aims: To understand the OBI prevalence among blood donors as well as to analysis its molecular cause of occult infection.

Methods: All blood donation samples were tested by dual ELISA for HBsAg, anti-HCV, anti-HIV and anti-Treponema pallidum and transaminase test, those ELISA negative and ALT less than 50 U/I were further screened by nucleic acid testing (NAT) for HBV/HCV/HIV. ELISA negative and HBV DNA positive samples were quantity determined and samples of HBV DNA between 20 and 1000 copies/ml were collected for sequencing. A total of 316 samples were screened, wherein 5 samples were sequenced. The translation products of which were also compared with standard S protein for genotyping and “a” determinant mutation analysis.

Results: The incidence of occult HBV among blood donors was 0.729% (10/134495). The positive yield of nested PCR for Pre-S was 35.9% (14/39). The uniform detection results indicated no mixed infection. Several mutation sites, S45D, S157, S157985). The positive yield of nested PCR for Pre-S was 35.9% (14/39). The uniform detection results indicated no mixed infection. Several mutation sites, S45D, S157, S157985).

Summary/Conclusions: The main cause of OBI may be due to low replication of HBV, deficiency of low sensitivity of reagent and virus mutation.

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Abstract has been withdrawn

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CORRELATION BETWEEN HBV-DNA AND HBsAg DETECTION RESULT OF VOLUNTARY BLOOD DONORS IN TIANJIN AREA
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Background: In China the prevalence of hepatitis B is much higher than world level. And the situation of HBV infection in blood donors is complicated. How to prevent the infection of HBV via transfusion is crucial. Although NAT has been widely adopted by blood banks, the traditional ELISA still plays an indispensable role in the screening of HBV.

Aims: To investigate the correlation between the detection results of HBV-DNA and HBsAg of voluntary blood donors.

Methods: Using TMA-chemiluminescence method to detect HBV-DNA of 323 HBsAg positive samples which tested by ELISA.

Results: In 323 cases with HBsAg positive, 7 cases (2.17%) were positive in HBV-DNA. The positive rate of HBsAg was 0.11% with the dual reagents. An overall deferral rate is 0.42% (566/134495) by serological examinations. The detection rate of HBsAg by the imported reagent was significantly higher than that of domestic reagent. The ratio of HBV-DNA positive samples were 26.3% (149/566) of all HBsAg's deferral. A sample of a combined mix of 6 serological negative samples were carried out. A total of 80 HBV-DNA positive specimens were detected. The detection rate is 0.06% (80/133744). The 80 specimens were also detected independently by omission of serological examination (omission factor is 0.06%, 80/134495).

Summary/Conclusions: To some extent, NAT can detect serological false-negative HBV samples, in particular, during HBV occult and window period infections. Secondly, the rate of false-positive was higher in serological tests, which should be confirmed, and recruitment of false-positive blood donors is necessary to reduce the waste of blood.

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Abstract has been withdrawn

P-293
THE ANALYSIS OF HEPATITIS B VIRUS SCREENING BY NUCLEIC ACID MIX-TESTING (NAT)
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Background: Ningxia, an autonomous area of Hui Muslim minority, and it has its own demographic characteristics. To ensure the blood safety, centralized nucleic acid testing has been conducted in the whole area since 2015. Two kinds of reagents were used for serological examination, NATs were then carried out for the serological negative samples.

Aims: To measure the detection of HBV by NAT in Ningxia Hui minority areas. To provide the basis for a rational scientific screening and a strategy for recruiting blood donors.

Methods: A total samples of 134,495 were collected from volunteer blood donors between 2015.1-2016.12.31. The HBsAg was tested twice by WanTai and BIO-Rad GenescreenTM ULTRA HBV Ag/Ab reagents. Negative samples were selected for measurement by NATs using Roche Cobas s201 nucleic acid testing kits. The testing results were collected, grouped, statistically analyzed using SPSS 21.0 software.

Results: Out of a total samples of 134,495 from volunteer blood donors, the positive rate of HBsAg was 0.23% when measured with imported reagents of Bio-Rad; the positive rate of HBsAg was 0.08% with domestic reagents of WanTai; the positive rate of HBsAg was 0.11% with the dual reagents. An overall deferral rate is 0.42% (566/134495) by serological examinations. The detection rate of HBsAg by the imported reagent was significantly higher than that of domestic reagent. The ratio of HBV-DNA positive detections was 26.3% (149/566) of all HBsAg's deferral. A sample of a combined mix of 6 serological negative samples were carried out. A total of 80 HBV-DNA positive specimens were detected. The detection rate is 0.06% (80/133744). The 80 specimens were also detected independently by omission of serological examination (omission factor is 0.06%, 80/134495).

Summary/Conclusions: To some extent, NAT can detect serological false-negative HBV samples, in particular, during HBV occult and window period infections. Secondly, the rate of false-negative was higher in serological tests, which should be confirmed, and recruitment of false-positive blood donors is necessary to reduce the waste of blood.

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Abstract has been withdrawn

P-295
ANALYSIS OF CENTRALIZED DETECTION RESULTS OF VIRUS NUCLEIC ACID “11+1” PATTERN IN XINJIANG REGION
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Background: Nucleic acid amplification (NAT) is a direct assessment of pathogen nucleic acid on the basis of molecular biology, as a supplement to the enzyme-linked immunosorbent assay (ELISA) blood test, greatly shortening the detection of “window period”, reducing blood transfusion Spread the residual risk of disease. Blood centralized detection As a high-quality, high-efficiency, low-cost operation and management model, has been recognized around the world, and developed in the country for many years. China National Health Commission in 2006 promulgated the “one law two rules”, issued in 2013, “blood bank set planning guidelines”, “to promote blood bank detection of 3 years Action plan “and other clear that the blood center laboratory should undertake regional centralized detection tasks, the provincial health and family planning departments should be based on the number of service population, the number of blood supply and drainage, geographical characteristics, traffic conditions, blood distribution density and detection technology level. The overall plan to assume the task of blood centralized detection of the central blood station, Urumqi Blood Center to assume “11 + 1” centralized detection model, that is, a blood center, 11 central blood stations, Xinjiang vast territory, 11
blood to the blood center distance of a total of 4200 km, through the detection data analysis Urumqi Blood Center Commissioned centralized testing to improve the quality of laboratory and blood safety.

Aims: Through the analysis of the "11 + 1" centralized test results, the paper discusses the application of centralized testing in Xinjiang, China and the problems to be solved.

Methods: (1) All samples have been excluded from the use of two different manufacturers of ELISA reagents for unpaid blood donors HBsAg, anti-HCV, anti-HIV detection of reactive samples; (2) using Roche nucleic acid blood sieve detection system or Kewei nucleic acid blood sieve HBV DNA, HCV RNA, and HIV RNA were detected by the control system (mixed with 6 mixed or 8). (3) The mixed samples were tested for dissolution.

Results: From December 2015 to July 2017 "11 + 1" centralized detection model were detected 130024 samples (blood center sample 84508, 11 blood pool centralized sample 45516), 25790 pool, split 199 pool, split out 123 (3 copies of anti-HCV, 2 HBsAg, of which 119 was HBV DNA positive, 4 were HCV RNA positive, and 4 were positive for HBV samples. The positive rate of blood samples in Urumqi was 0.07% [55/84508]. The positive rate was 0.15% (68/130024) [45516].

Summary/Conclusions: In Xinjiang, China, the number of blood samples in Xinjiang is very small, only 1-2 times a week to carry out experiments, "11 + 1" centralized detection model can reduce the risk of blood transfusion, improve blood transfusion safety, and in reducing costs, reporting in a timely manner There are advantages, but the sample transport cold chain control also need to strictly control.

P-296 BLOOD SCREENING FOR HBV DNA: THE VALUE OF EQA PROGRAM IN CONTINUOUS PERFORMANCE IMPROFMENT FOR PARTICIPANTS, COMMERCIAL KIT AND THE EQA ORGANIZER

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Background: Hepatitis B virus (HBV) DNA nucleic acid test (NAT) was implemented in blood banks in China since 2010. Since different HBV NAT assays are used by different blood banks, we do not know the performance of each laboratory, let alone their performance.

Aims: This study analyzed the results of an external quality assessment (EQA) from 2015 to 2017 for quality improvement in participating laboratories.

Methods: Each panel, consisting of 19 positive samples ranging from 28.3 IU/ml to 648 IU/ml and 31 negative samples made by National Center for Clinical Laboratory (NCCl), was deployed in April and October each year from 2015 to 2017. A total of 5 panels were tested during this period. The participants were required to test these EQA samples in the same way as donor samples. Concordance rate and cycle threshold (Ct) value in EQA programs were analyzed. For discrepant results, a thorough investigation and corresponding corrective actions were conducted to achieve quality improvement in these laboratories.

Results: A total of 1024 EQA reports were received from 349 laboratories during the 3 years. Firstly, we analyzed the concordance rate for the positive and negative samples. The overall concordance rate for positive samples was 97.3% and negative samples was 97.9%, therefore, around 2% of the participants had inaccurate results.

After analyzing the results based on the commercial kit used, the overall concordance rate of the commercial kits for negative samples was higher than 97% while commercial kit 55001, 55081 and 55178 had the lowest concordance rate for positive samples, at 91.6%, 91.3% and 93.0% respectively, suggesting their poor intrinsic performance.

Summary/Conclusions: As a whole, EQA program could provide a valuable quality improvement tool for participants, commercial kit and the EQA organizer.

P-297 SEROLOGICAL AND MOLECULAR CHARACTERIZATION OF HEPATITIS B VIRUS INFECTION IN BLOOD DONORS BORN BEFORE AND AFTER IMPLEMENTATION OF UNIVERSAL HBV VACCINATION IN CHINA

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Background: Neonatal hepatitis B vaccination program at birth has been implemented nationwide since 1992 in China, which may impact HBV safety in blood donations. With more sensitive triplex nucleic acid tests (NATs) implemented for HBV screening after EIA in Chinese blood center, Testing discrepancies between NAT and EIA are needed to be confirmed.

Aims: To investigate hepatitis B virus infections between blood donors born before and after the universal HBV vaccination program in Shenzhen, and analyze the serological and molecular Characterization.

Methods: A total of 242 reactive by NAT and/or HBsAg EIA samples from 26320 candidate blood donors were detected, the discrepant results were tested with commercial ELISA: nested PCR: sequencing and a quantitative real-time polymerase chain reaction (PCR) assay.

Results: 112(58.79%) of 154 EIA HBsAg+ samples were confirmed HBsAg positive, The HBsAg confirmed positive rate (0.73%) in first time presuming vaccinated donors is lower than in non-vaccinated donors (P < 0.001), 19% of 242 EIA HBsAg+ or NAT initial reactive samples were confirmed HBV DNA positive, the total positive rate of HBV DNA was 0.741% (195/26320). The positive rates of HBV DNA in the non-vaccinated blood donors (0.78%) is higher than in the vaccinated blood donors (0.56%, P < 0.05). The positive rates of Occult hepatitis B virus infection (OBI) in the presuming vaccinated donors was 0.093% (6/6422), and significantly lower than the non-vaccinated donors (P < 0.05). The genotype distribution of HBV was similar between presuming vaccinated donors and non-vaccinated donors (P > 0.05).

Summary/Conclusions: HBsAg EIA and Highly sensitive NATs require further Confirmatory testing. The universal HBV vaccination program markedly reduces the risk of HBV infection in blood donors, and provides an effective guarantee for the safety of blood transfusion.

P-298 SEROLOGICAL STATUS ANALYSIS ABOUT 31 CASES OF SPECIMENS WHICH WERE NUCLEIC ACID REACTIVE

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Background: Our country is hepatitis B superpower. Chinese people who carry the hepatitis B surface antigen was 7.18%. Due to the effects of ELISA method, the longer window period and virus subtype variation was the bottleneck of further improve blood safety. Nucleic acid detection of virus nucleic acid amplification directly had better sensitivity and specificity. Nucleic acid detection increasingly popular in the blood detection, played an important role in our country who had a high rate of HBV, especially for avoiding window or occult HBV infection spread of hepatitis blood transfusion. In OBI, anti-HBe usually said after infection acquired immunity together with anti-HBs. In some countries such as Germany and Japan blood was safe, which anti-HBs was detected more than 100 IU/l. Anti-HBs in 20 to 160 IU/l could reduce five times the blood transfusion infection. In HBV infection high prevalence area, taking anti-HBs and anti-HBe detection may be play an important role in clinical blood use.

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Aims: To ensure the safety of clinical blood transfusion, analysis the serological status about 31 cases of specimens which was nucleic acid reactive. After take the matrix representation mode, assessment to reduce blood transfusion residual risk of HBV transmission.

Methods: 59 762 cases of blood donors (excluding ones of the same positive in ELISA, ALT) were detected by NAT and CLIA.

Results: Nucleic acid was detected in 31 cases of DNA HBV reactive specimens, 0 cases of RNA HBV/HBV reactive specimens. 1 case in ELISA method was higher "negative value" specimens. In CLIA method detection, 10 cases who no response was suspected the window period specimens. The rate of anti-HBs reactivity was 67.7% (21/31) which suspected the OBIV specimens. All HBsAg-anti-HBe- (+) and HBsAg-anti-HBc- (+) were 25.8% (8/31) and 25.8% (7/31). According to the relationship between anti-hbs droplet and blood safety of Germany and Japan, the safe blood of > 100 IU/L was found to be 16.1% (5/31). Anti-HBs titer (20-100) IU/L which could reduce blood transfusion infectivity was found to be 16.1% (5/31). The residual total number of 67.7% (21/31) was completely cut off HBV blood transmission by nucleic acid detection.

Summary/Conclusions: First, blood donors detect methods in NAT and ELISA method was complementary, NAT detection can make up the "window period" of ELISA method. Second, NAT and CLIA test results were consistent; Third, OBI may be the main types of HBV DNA NAT detected blood donors in landan area. Fourth, the "negative value" high specimen in ELISA, which affected the quality of blood, reduced risk of blood transfusion infection risk. Fifth, Healthy blood donation population should be encouraged to regular physical examination and injection vaccination of hepatitis B, increased Anti-HBs drops. Sixth, It is suggested that the Anti-HBs detection in the high epidemic area of hepatitis B may be of great signification to further guarantee clinical blood safety.

P-299
THE ANALYSIS OF ABNORMALITY SCREENED IN FREE BLOOD DONATION
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Background: According to the health inspection requirements of blood donors in China, pre-screening test is conducted for blood donors. The main items used for blood donation are HBsAg, ALT, blood type, hemoglobin. Aims: To reveal the unqualified cases screening of blood donors in Nanchang, and put forward countermeasures to avoid the waste of blood resources.

Methods: For the period from May 1, 2015 to May 31, 2016, the total unqualified rate of total and component screening among the whole blood donors and the platelelet donors, student and non-student groups, and primary and repeat blood donors.

Results: The positive rates of primary screening, HBsAg and ALT were significantly different between the students and the non-students. There was no significant difference in the rate of blood specific gravity. There were significant differences in the total failure rate and HBsAg positive rate between the first and the repeat blood donors, and the ALT failure rate had no significant difference. There were significant differences in total failure rate and HBsAg positive rate between the whole blood donors and the platelet donors, and no significant difference in ALT failure rates.

Summary/Conclusions: To formulate a suitable pattern is an effective way to improve the safety of blood transfusion for different types of blood donors. We may consider abolishing the HBsAg gold standard method test screened in team donation of the repeat blood donors, and the abolition of ALT screening test of student groups in team donation.

P-300
ENHANCED DETECTION OF HEPATITIS B VIRUS (HBV) DNA BY A MORE SENSITIVE COMMERCIAL POLYMERASE CHAIN REACTION ASSAY IN HONG KONG BLOOD DONORS
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Background: With the implementation of nucleic acid testing (NAT) for HBV DNA on individual donor samples, a subset of donations with HBsAg positive HBV DNA negative results were identified. They accounted for 8.5% and 4.0% of all confirmed HBV infections in donations screened by NAT using Procleix ULTRIO and ULTRIO Plus assays on the TIGRIS platform (Grifols, Emeryville, CA) during 2007–2009 and 2009–2011, respectively.

Aims: (1) To evaluate the performance of the cobas® MPX test on the cobas® 6800 System (Roche, Pleasanton, CA); and (2) To characterize the serological profile of these HBsAg+ HBV DNA negative samples in the Hong Kong Chinese donor population.

Methods: Fifty-five free archive samples (frozen at –18°C) collected from 2011 to 2014 with discordant serological and NAT results [i.e. PRISM HBsAg (Abbott, Abbott Park, IL) positive, confirmed by neutralization; and NAT non-reactive (either non-reactive by ID screening or non-discriminatory by dHKV, ULTRO Plus)] were tested with cobas® MPX on the cobas® 6800 System. Repeat testing was performed in initial non-reactive samples if sample volume permitted. The archive samples were also tested for extended HBV serological markers, i.e. anti-HBs, IgM and total anti-HBc, HBsAg and anti-HBe.

Results: With regard to demographic data, 27 (49.1%) were from men and 28 (50.9%) from women; 50 (90.9%) from first-time donors, 3 (5.5%) repeat donors and 2 (3.6%) lapsed donors; mean age and SD were 32.8 and 10.0 years respectively. 28/55 samples (50.9%) were reactive for HBV on cobas® MPX on the first run. Of 30 initial non-reactive samples on first run, 25 had sufficient volume for retesting; of which, 6 were tested reactive on the second run. For the other serological markers: (1) anti-HBs< 10 mIU/ml (51/56, 91.1%), (2) IgM anti-HBc-negative and total anti-HBc-positive (54/54, 100%), (3) HBsAg-negative (54/54, 100%), (4) anti-HBc-positive (47/53, 88.7%). The ratios of sample readings to cut-off value (S/CO) generated from PRISM HBsAg ChLIA for the 2 groups of sample (HBsAg+ MPX initial reactive group and HBsAg- MPX initial non-reactive group) were significantly different (P = 0.0036). The former area group median (n = 25) had a median S/CO of 156.11 (Range: 1.23-537.93) and the latter (n = 30) median S/CO of 47.72 (Range: 1.17-505.27).

Summary/Conclusions: In Hong Kong, when donations were screened by a highly sensitive ID-NAT, 4.0% of all confirmed HBsAg+ donations had HBV DNA levels undetectable by ULTRO Plus. The serological pattern of these donations was overwhelmingly homogenous: HBsAg-, anti-HBs <10 mIU/ml, IgM anti-HBc-, total anti-HBc+, anti-HBsAg-, anti-HBe+, consistent with chronic infections, where variability in large amounts of S-protein are produced and circulated as free protein or aggregated in pseudo-particles, which are detected as HBsAg. With better NAT reagent performance, more of these samples would test DNA positive suggesting that the discordant results are mostly related to analytical sensitivity of the test system. In this respect, cobas® MPX detects more HBV samples with low viral loads. PRISM HBsAg S/CO values were higher in the MPX+ group when compared with the MPX- group, but a bright-line S/CO value could not be defined to predict MPX results.

P-301
EPIDEMIC AND MOLECULAR CHARACTERIZATION OF OCCULT HEPATITIS B VIRUS INFECTION IN BLOOD DONORS OF NORTHERN CHINA
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Background: Occult hepatitis B virus infection (OBI) in blood donor is focused on since nucleic acid testing (NAT) was implemented in blood screening to reduce transfusion transmitted hepatitis B virus infection. Though quite a few studies had involved in OBI blood donor around the world, the prevalence and characterization of OBI in blood donors of Northern China has not been well revealed due to the diversities among different types of HBV.

Aims: To explore the prevalence and analyze the characteristics of hepatitis B virus S gene of occult hepatitis B virus infection in blood donors of Northern China.

Methods: All donors were screened by rapid assay of HBsAg before donation and eligible donors were tested with two HBsAg ELISA kits and Cobas Taqscreen MPX in 6-samples mini-pool or Procleix Ultra ID for HBV DNA. NAT-yield donations were discriminated the type of virus. Follow-up and archive samples of HBV DNA+/HBsAg- and NAT non-repeat reactive donors were further tested semilogic markers of HBV by electrochemiluminescence assay and individual NAT. HBV of OBVs confirmed by follow-up or/and trace back were tested virus load and sequenced S gene as well. HBV S genes of OBVs were compared with that of HBV DNA+/HBsAg+ donors paralleled in Dalian Blood Center.

Results: 198 232 donations were screened between 2nd Dec 2015 and 31st May 2015. Follow-up and trace back of 80 donors among 169 NAT-yielded were completed by the end of December 2015. 106 HBV infected donors were confirmed: 79 OBVs (1 in 2003 donations), 5 serological window period infections, 11 acute infections and HBV infective status uncertain in 11 cases. Sero-reactivity was observed in all OBVs. 74/79 (93.7%) were anti-HBc+ while 5/96(5.3%) were anti-HBs+ only.
Fifty-eight S gene sequences of OBLs were obtained. HIV type C and type B were dominant (79.3% and 13.8%, respectively). OBLs, strains showed a significant higher genetic diversity comparing with strains from HBV DNA/HBVAg- donors matched \((P < 0.05)\), which differed from OBLs \((p = 0.05)\). Several obvious variations in single amino acid sites were observed: T47K/V, A101K/R, T118K/R, K122N, P127T/I, I164D/S, S174N in type C and S311, Y161F/S, V168A in type B.

Summary/Conclusions: The prevalence of OBLs was observed 1:2003 in blood donors of Northern China. Occult HBV genotype C strains which were dominant showed a higher genetic diversity in gene S. Some variations in single amino acid sites were suspected to be related with HBVAg secretion.

Hepatitis C (HCV)

P-302
THE ASSOCIATION OF CLASS I HLA ALLELES WITH THE NATURAL OUTCOME OF HCV INFECTION AMONG BLOOD DONORS FROM GUANGZHOU, CHINA
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Background: China is one of the countries with high prevalence of hepatitis c virus (HCV) infection. It is reported that about 30 million Chinese people were HCV anti-body positive. Infection of HCV have two divergent natural outcomes: spontaneous clearance of the infection occurred in 10–40% of the persons, while HCV may develop persistant infection. Although the mechanisms are not thoroughly elucidated, it has been well-established that the natural outcome of HCV infection is closely associated with host genetic factors.

Aims: The purpose of our study is to understand the correlation between the polymorphisms of class I human leukocyte antigens (HLA) molecules and the natural outcome of HCV infection in Guangzhou blood donors.

Methods: 600 blood donors infected with hepatitis C were randomly selected in Guangzhou blood center. They were divided into two groups: spontaneous clearance group \((n = 200)\) and chronic infection group \((n = 400)\). High-resolution genotyping of classIHLA alleles were performed using HLA-SBT technology. The difference of the frequencies on classIHLA alleles between spontaneous clearance group and chronic infection group was analyzed to identify possible genes that affect natural outcome of HCV infection.

Results: Our results showed that the frequencies of seven HLA alleles were significantly different between the two groups. Five genes \([A^*02:01][0.3\% vs 6.1\%, \(P = 0.011\)], \(A^*30:01[1.5\% vs 3.2\%, \(P = 0.039\]), B^*13:02[6.5\% vs 2.9\%, \(P = 0.014\]), B^*15:02[5.6\% vs 3.9\%, \(P = 0.011\])\) and \(C^*04:01[1.9\% vs 1.5\%, \(P = 0.046\)]\) appeared to be more frequent in spontaneous clearance group. Frequencies of two alleles \(A^*13:01[13.4\% vs 15.6\%, \(P = 0.04\)]\) and \(A^*10:01[3.1\% vs 3.9\%, \(P = 0.043\)]\) were removed from the alignment. Recombination event analysis was performed with BEB4.45 software. In this paper, the recombination analysis was based on Core and NS5B regions of HCV genome sequence. Recombination in complete genome sequences will be further detected.

Summary/Conclusions: Six reconstruction events were detected in sixteen samples. Four recombination breakpoints located in Core region and two in NS5B. Recombination forms included inter-genotypes and intra-genotypes, such as 1b/1b and 1a/1b.

P-304
THE RESEARCH ON THE ORIGIN AND TRANSMISSION PATTERN FOR HCV 6A IN CHINA
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Background: China is one of the countries where hepatitis C virus (HCV) is increasningly epidemic which has imposed a major health problem. Studies have shown that HCV 6a is a relative new subtype in China.

Aims: To reveal the distribution, origin, and transmission pattern of HCV 6a subtype in China.

Methods: 50 HCV RNA positive samples for each province were collected from 29 provinces all over China. E1 and NS5B fragments of HCV were amplified by RT-PCR, followed by DNA sequencing and phylogenetic analysis to determine the accurate genotypes. Bayesian coalescent analysis integrated in BEASTv1.8.10 was utilized to reconstruct the phylogenetic tree for subtype 6a to detect the origin, transmission pattern and trend of HCV 6a subtype. The Bayesian factor (BF) was calculated by Tracer.v1.5 program to compare the models in order to choose the statistically more robust one. We also used Tracer program to reconstruct the BSP (Bayesian Skyline Plot) and calculate the tMRCA (Time of most recent common ancestor).

Results: HCV 6a was found to concentrate in the South region (including Guangdong, Guangxi and Hainan) of China (43.68%), followed by East-inland (22.99%), East-coast (12.64%), Central (11.49%), Southwest (6.90%) and rarely found in north part of China (2.30% in North, Northeast and Northwest). GTR+G+I model and Exponential model were found to be the best models for 6a subtype. The tMRCA for 6a was found to be 1990 (95% Confidence interval: 1976–1998). BSP curve was plotted using Tracer program to view the epidemic history and the rapid phase (2001–2005) of viral population growth.

Summary/Conclusions: HCV 6a subtype was introduced into South region of China around 1990s, which was originated from Vietnam via Hong Kong, and afterwards spread to the other districts of China. Rapid increase for 6a in China was found during 2001–2005 and then grew gently.

P-305
THE COMPARISON OF HEPATITIS C VIRUS SUBTYPE DISTRIBUTION BETWEEN BLOOD DONORS AND INJECTION DRUG USERS IN GUANGDONG, CHINA
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Background: Hepatitis C virus (HCV) genotypes can serve as a predictor for sustained response to interferon therapy and aid to determine the optimal duration of treatment. Subtype distribution varies among blood donors (BDS) and intravenous drug users (IDUs) in different areas.

Aims: In this study we learn the characteristics of IDUs with HCV infection in Guangdong, and compare HCV genotype distributions between the two different people groups in one place.

Methods: A total of 286 anti-HCV positive IDUs were recruited from a men’s prison and a women’s prison in Guangdong province of China, from 2009 to 2011. 5 ml of whole blood were draw from the study subjects and sera were isolated immediately.
The sera were subsequently applied to test for the presence of HCV RNA by nucleic acid tests (NAT). The viral genotypes of HCV RNA positive sera were determined by phylogenetic analysis using E1 and/or NS5B gene sequences. The distribution of HCV genotypes of IDUs was compared with that of the BDs recruited in our previous study. The difference of HCV genotype distribution between the BDs and IDUs was analyzed using the Chi-square test or Fisher’s exact test when the chi-square test condition was not satisfied. The continuous variables were compared among different cohorts using one-way ANOVA. Difference in age between the two cohorts was examined with student’s t-test.

Results: Our results showed that the rate of spontaneous clearance was significantly higher (10.0%, 9/90) in female IDUs than (9.4%, 24/256) in male IDUs. The proportion of HCV 1b (P = 0.381) and 2a (P = 0.030) in BDs were higher than in IDUs. In contrast, HCV 1a (P = 0.037), 3b (P = 3.4E-9) and 6a (P = 1.2E-5) were more prevalent in IDUs than in BDs. Moreover, multivariate logistic regression analysis incorporating factors such as age, gender and intravenous drug use was found to be significant. Infection with HCV 1b was found to be more prevalent in blood donors (odds ratio [OR] = 0.027, P = 4.9E-14), while subtype 3b and 6a were found to be independently more prevalent in intravenous drug users (OR = 8.477, P = 8.0E-08 and OR = 1.676, P = 0.006, respectively), independently of age and gender.

Summary/Conclusions: In summary, HCV genotype distribution was significantly different between IDUs and BDs, which supported the correlation of different transmission routes with different subtype distribution. Thus, different measures for the prevention of HCV transmission should be implemented according to the transmission pattern of HCV subtype, and the control of drug use and trade in Guangdong province should be enhanced to effectively reduce the prevalence of HCV 3b and 6a.
THE NECESSITY OF GREY AREA IN ANTI-HCV BY ELISA
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Background: The same two positive specimens were found by both RIBA confirmatory test and HCV RNA nucleic acid testing in 167 grey area samples. We must pay more attention to the HCV grey area specimens by ELISA, due to the limitation of ELISA experiment with ELISA kits from different manufacturer.

Aims: To apply two kinds of methods, including RIBA confirmatory test and HCV RNA nucleic acid testing (NAT), to detect grey area specimen (OD: 0.6 ≤ s/co < 1, detected by ELISA) and analyze their results.

Methods: Apply ELISA to detect the blood specimens with two kinds of reagents from Zhitai Liuzhu and Shanghai Kehua, and the specimens whose OD 0.6 ≤ s/co < 1 would be tested again by RIBA confirmatory test and HCV RNA nucleic acid testing respectively.

Results: The same two positive specimens were found by both RIBA confirmatory test and HCV RNA nucleic acid testing in 167 grey area samples.

Summary/Conclusions: We must pay more attention to the HCV grey area specimens by ELISA, due to the limitation of ELISA experiment with ELISA kits from different manufacturer. The samples with grey area could be detected positively by both RIBA and HCV-NAT, therefore, adding NAT to detect blood samples, is of great practical significance to ensure the safety of clinical blood transfusion.

PERFORMANCE OF NEW GEENIUS HCV SUPPLEMENTAL ASSAY
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Background: The new Bio-Rad Genius HCV Supplemental Assay is a qualitative single-use immunochromatographic test for the confirmation of individual antibodies associated with infection caused by the Hepatitis C Virus (HCV) in human venous whole blood, serum or plasma samples.

Genius HCV Supplemental Assay is intended for use as an additional screening and/or diagnostic test to confirm the presence of antibodies to HCV for specimens found to be reactive by screening procedures. This assay allows the individual detection of antibodies to Capsid (Core), NS5, NS4 and NS3 proteins. It is associated with Genius reader and software for results automated interpretation.

Aims: The aim of this study, performed by Bio-Rad R&D department was to evaluate the performance of this new assay in terms of sensitivity, specificity and reproducibility on blood bank routine samples, hospitalized patients, chronic samples and seroconversion panels compared to serology and/or supplemental reference assays.

Methods: A validation of this new rapid test was performed. Specificity was evaluated on fresh negative serum, venous whole blood and plasma samples from blood bank (n = 250) as well as on serum samples from hospitalized patients (n = 100) and patients with unrelated medical conditions (n = 75). Sensitivity was tested on samples from chronic HCV infected patients (n = 100) and on clinical anti-HCV positive samples (n = 76). Ten commercial seroconversion panels were tested. All results were obtained using automated reading with Genius™ system (reader & software).

Results: Regarding specificity, no false positive result was found among blood bank, hospitalized and unrelated medical condition patient samples. Less than 3% indeterminate rate was observed.

Sensitivity of 100% was obtained on clinical HCV seropositive and chronic HCV infected patient samples with similar results to INNO-LIA® HCV Score Assay. Performance obtained on seroconversion panels was higher than Deciscreen™ HCV Plus Assay and equivalent to INNO-LIA® HCV Score Assay. Assay reproducibility study (intra and inter-reproducibility) showed no status changes.

Summary/Conclusions: Performance obtained during evaluations met the required specifications in terms of specificity and sensitivity. The new Bio-Rad Genius HCV Supplemental Assay is the first unitary assay for confirmation of anti-HCV antibodies presence in serum, plasma and venous whole blood sample with automated reading and interpretation. In addition, the expert software allows full traceability of the results obtained in less than 30 min.
Background: National surveys on blood collection and supply were launched by Blood Donation Promotion Committee, a branch of Chinese Society of Blood Transfusion, every 3 years since 2006. Considering the threat of HIV to blood safety, questions associated with HIV infection in blood donors were decided to add into the questionnaire in the second survey (2009-2011) and then information of gender, age and donating frequency of HIV infected donors were asked in the third survey (2012-2014) in order to search ways to reduce the risk of transfusion-transmitted HIV infection.

Aims: To investigate and analyze HIV infections of blood donors around China in 6 years from 2009 to 2014.

Methods: As requirement by Ministry of Health of China, all samples reactive to HIV markers in blood screening must be sent to local Centers for Disease Control and Prevention to confirm HIV-infected using western blot. Feedback information of HIV infection in blood donors was collected by questionnaires distributed to blood centers or blood banks in China. The data of gender, age and donating frequency of HIV infected donors were analyzed and HIV detection rates were compared according to year and province as well.

Results: The upward trend of HIV infection among blood donors in majority provinces of China were observed. Average HIV detection rate of nationwide increased from 1.45 (0.41-7.16) per 10,000 donations in 2009 to 2.48 (0.94-5.92) per 10000 donations in 2014 paralleled with the number of provinces of which HIV detection rate above 2 per 10,000 donations rising to 20 from 8. Nevertheless, the data were flat in a few provinces and that of Yunnan Province was significant decreased from 7.16 to 3.87 per 10,000 donations simultaneously. Eighty-five to eighty-nine per- centage of HIV infected blood donors were male and most of them were confirmed or suspected to be MSM or related to MSM. HIV-infected donors between the ages of 26 and 45 account for 54% in 2014 decreasing from 60% in 2012 while percentage of that between the ages of 18 and 25 raised by 5%. Furthermore, about 66% of HIV infections was from donor but it was worth to notice that repeat donors who had donated no less than three times account for around 12%

Summary/Conclusions: HIV infection among blood donors showed an upward trend in China. HIV-infected MSM was the major threat to blood safety and accompanied by a younger age. Some measures need to be adapted to improve donor’s self-exclusion before donation and initiative notification after donation.

P-315

PEPTIDE ASSEMBLY NANOPARTICLES LOADED WITH HDAC INHIBITOR ACTIVATE LATENT HIV

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Background: At present, antiretroviral therapy is only able to control HIV replication, rather than completely eradicating virus from patients. This is due in part to the establishment of a latent virus reservoir in resting CD4+ T cells, even at the presence of highly active anti-retroviral therapy (HAART). It is believed that forced activation of latently infected cells can induce viral production, allowing cells to be targeted by an immune response. Histone deacetylase (HDAC) inhibitors have been the most widely investigated latency-reversing agents (LRAs), but most of them resulted in only a modest and transient reactivation of HIV, making it an impractical therapy for HIV reactivation. Therefore, a novel approach to improving the potency of latency activation is required. Nanoparticles can provide a number of advantages over more traditional drug delivery methods, including improved drug solubility, stability, drug targeting, and release.

Aims: Our strategy was confirmed effective to improve the hydrophobic HDAC inhibitor delivery for the treatment of latent HIV. Here, we describe a novel cell-penetrating peptide assembly nanoparticle loaded with the histone deacetylase inhibitor panobinostat (PNP-P). Method of Blood Screening, Dalian Blood Center & Blood Donation Promotion Committee, Chinese Society of Blood Transfusion Dalian Blood Center, Dalian, China

Methods: Our strategy was confirmed effective to improve the hydrophobic HDAC inhibitor delivery for the treatment of latent HIV. Bitor panobinostat (PNP-P).

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Background: Prevention of transfusion-transmitted HIV infection requires a sensitive and specific donor screening strategy. The two-different-EIAs strategy (using two highly sensitive EIAs in parallel) has been the mandated strategy for routine donor screening in China for many years and is the current strategy used by most Chinese blood centers. The recent change in government regulation now allows donor screening using one EIA (single-EIA strategy) or one CLIA (Chemiluminescent immunoassay) (single-CLIA strategy) for HIV antibody/antigen.

Aims: To evaluate the performance of current two different-EIAs strategy with that of the single EIA and single CLIA strategies for HIV screening.

Methods: We performed HIV Ag/Ab chemiluminescent microparticle immunoassay (CMIA, Abbott Diagnostics, a version of CLIA) testing on 2,138 samples from four blood centers which have all undergone routine testing using the two-different-EIAs strategy. Results from routine donor HIV EIA screening testing were obtained from the blood centers. 1931 samples were nonreactive by both EIAs, 63 were reactive by EIAs, 102 were reactive by one EIA and 42 were defined as gray zone by either one or two EIAs. Western blot (WB) was performed on all samples with one or both EIA reactive or grey zone result as well as on all EIA negative samples with reactive CMIA results for confirmation. Performance of CMIA, different EIAs and the three strategies were evaluated by comparing the testing results to the confirmed HIV infection status defined by WB positivity.

Results: The positive coincidence rate of HIV Ag/Ab tests with HIV infection status was found to be 95.87% (95% CI: 90.62-98.64%) and the negative coincidence rate of HIV Ag/Ab tests with HIV infection status was 99.31% (95% CI: 98.89-99.61%), both of which seemed higher than or even equal to that of EIAs. Good consistency (Kappa value higher than 0.75) with HIV infection status were found by CMIA (0.88), Kehua ELISA (0.78), BioMerieux ELISA (0.77) and Bio-Rad ELISA (0.76); among which CMIA has the best consistency with HIV infection status compared to all EIAs studied. Of the 224 samples with discrepant results by EIAs and CMIA, 4 samples confirmed positive by WB were reactive by single-CMIA but missed by two-different-EIAs strategy while only one sample missed by single-CMIA compared to two-different-EIAs strategy. One infected sample out of the 224 tested as gray zone by two-different-EIAs strategy and reactive by single-CMIA. All 91 single-EIA reactive samples tested nonreactive by CMIA and negative by WB.

Summary/Conclusions: This is the first study to compare the performance of recently allowed single-EIA, single-CLIA and the currently used two-different-EIAs strategy for HIV blood screening in China. Our results suggest that CMIA performed better than EIAs according to the positive coincidence rate, negative coincidence rate and the consistency of these assays with the real infection status. The advantage of the one-CMIA strategy includes lower false negative and false positive rates. Thus, the implementation of one-CMIA strategy may help to further reduce the risk of transfusion transmitted HIV infection, and need to perform multiple assays, while decrease the unnecessary waste of blood caused by false positive results.
A COMPARATIVE SEROLOGICAL STUDY OF HIV SCREENING IN BLOOD DONATIONS BY ELISA, CLIA AND ECLIA IN CHINA

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Background: The serological test of human immunodeficiency virus (HIV) is crucial to prevent the transmission of HIV through blood transfusion. In China, enzyme linked immunosorbent assay (ELISA) is the only assay approved for HIV screening in blood donations. Completely automated chemiluminescence immunosassay (CLIA) or electrochemiluminescence immunosassay (ECLIA) are emerging technologies for the detection of HIV, therefore it is beneficial to evaluate the performance of CLIA, ECLIA and ELISA.

Aims: There was no prior comparative evaluation between CLIA, ECLIA and ELISA in China, therefore the purpose of this study is to compare these assays and determine which one performs better for detection of HIV in blood banks.

Methods: A total of 1036 plasma samples were collected from 16 locations, including National Center for Clinical Laboratories, blood centers and blood banks. 583 plasma samples that were nonreactive for anti-HIV, and elevated levels of alanine aminotransferase (ALT), served as negative control and 483 anti-HIV reactive samples served as positive samples. These 1036 samples were tested by eight ELISAs (B, D, I, L, I (4th), K, W, W (4th)), CLIA (A) and ECLIA (R). True positives were defined by dual positive of CLIA and ECLIA. Samples with discrepant results between CLIA and ECLIA were further tested by nucleic acid testing using the Roche Molecular Systems assay, cohab® TagScreen MPX Test, Version 2.0 by individual donation testing (ID-NAT). HIV-positive samples that were missed by ELISAs were also confirmed by ID-NAT. Lastly, we compared CLIA and ECLIA against ELISA methods.

Results: From the 483 anti-HIV reactive samples, 137 samples were considered as true positives (CLIA+ & ECLIA+) and subjected to further testing with ELISAs. 7 of the ELISAs did not detect all the 137 HIV positive samples. ELISA (K, L) did not detect 4 HIV positive samples, ELISA (W) did not detect 3 HIV positive samples and ELISA (W (4th), I (4th), D) did not detect 2 HIV positive samples. Most ELISAs missed 3 HIV-positive plasma samples (No: HIV000150051, HIV008150021, HIV019150004), but these 3 samples were detected by CLIA, ECLIA and ID-NAT. 2 samples (No: HIV000150051, HIV008150021) were missed by all ELISAs except B and 1 sample (No: HIV019150004) was missed by four ELISAs (I, K, L, and W). After removing the uncertain results of ELISAs, several false positive results were found in all methods (A has 7, R has 8, I has 12, L has 17, K has 19, L (4th) has 24, W (4th) has 30, W has 32, D has 51 and B has 79). The sensitivity of CLIA (100%) or ECLIA (100%) had no significant difference, compared with the eight ELISAs (P > 0.05) (B, D, K, L, I (4th), I, W, W (4th)); 100%, 98.5%, 97.1%, 98.5%, 98.5%, 97.8%, 95.8%). The CLIA (A) showed higher specificity (99.2%) than the most of ELISA assays (A vs L, K, L (4th), W, W (4th), D, B; 99.2%, 98.1%, 97.9%, 97.0%, 96.6%, 96.4%, 94.3%, 91.1%; P < 0.05, 0.05, 0.01, 0.01, 0.01), the ECLIA (R) showed similar specificity (99.1%) with A (R vs L (4th), W, W (4th), D; 99.3%, 97.9%, 97.0%, 96.6%, 96.4%, 94.3%, 91.1%; P > 0.05, 0.05, 0.01, 0.01, 0.01). Summary/Conclusions: CLIA and ECLIA have successfully detected the HIV-positive samples that were missed by ELISA during the early HIV infection. Therefore, compared with ELISA, CLIA and ECLIA are more specific and sensitive to detect HIV antibodies/antigens in blood donations. In the future, CLIA and ECLIA may be an alternative test to ELISA for HIV screening in blood donations in China, subject to approval by local authorities.

NRL BLOOD SCREENING EQAS, 2015–2016. HOW IS IT TRENDING?

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Background: NRL provides Quality Assurance programs to laboratories that test for blood-borne infectious diseases. One of the components of NRL Quality Assurance is External Quality Assessment Schemes (EQAS). Participation in EQAS gives participants a means of assessing independently their laboratory performance and comparing their results with those of others in their peer group. It also offers a means of examining the performances of different assays.

Aims: 1. To examine the ability of participants to detect nucleic acid in samples containing different amounts of HIV-1 RNA, HCV RNA and HBV DNA with respect to Blood Screening EQAS (NATA4315).
2. To examine the ability of participants to detect and discriminate correctly between HIV-1 RNA, HCV RNA and HBV DNA positive samples in the Blood Screening EQAS (NATA4315).

Methods: Participants' data from six NATA4315 EQAS test events over 2 years were analysed. In 2015 15,782 results were submitted from an average of 28 assays. In 2016 18,616 results were submitted from an average of 27 assays. The Multimarker Blood Screening NAT EQAS panels consisted of fifteen samples. These panels were composed of well-characterized plasma samples of known concentrations. The samples were calibrated against the WHO international standards for HIV-1 (97/650), HBV (97/750) and HCV (06/102). The results of testing were submitted to NRL using the internet application OASYS (Oneworld Accuracy, Canada). Aberrant results were those that were reactive for samples that did not contain HIV RNA, HCV RNA or HBV DNA [a result of “Detected” for an analyte-negative sample] and were non-reactive for a sample with a viral load [a result of “Not Detected” for an analyte-positive sample].

Results: The highest number of laboratories participating in the NATA4315 EQAS program over the 2 years was 131 with a mean of 120.

In 2015 there were 2590 results submitted for replicate negative samples over the three test events. All negative samples consisted of NIP and were identical in composition, being dispensed from the sample pool of NIP and were negative for HIV RNA, HCV RNA and HBV DNA. Only six of 2590 (0.23%) results were reported as falsely reactive. In 2016 eight of 3132 (0.26%) results were reported as falsely reactive. Reported false negative results were also analysed for all three analytes. For HIV samples at a concentration of 500 IU/ml there was a reduction in reported false negative results from 0.79% in 2015 to 0.36% in 2016. Similar trends were seen in HIV samples at a concentration of 250 IU/ml. In 2015 2.16% of reported false negative results were reported compared with 1.29% in 2016. These trends were reflected in HIV samples as well.

Summary/Conclusions: When comparing overall NATA4315 participant results from 2015 with overall NATA4315 participant results from 2016, there was a reduction in falsely reactive results and false negative results over the 2 years. Participation in EQAS allows laboratories to assess their performance over several years and to observe and facilitate improvements.

APPLICATION OF NAT IN HIV SCREENING OF BLOOD DONORS IN HOHOT AREA

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Background: In recent years, Hengyang and Fuzhou had blood transfusion infected with HIV reports. To provide the safety blood for clinic have become the biggest challenge for every blood worker.

Aims: To analyze the situation of HIV blood screening in Hohhot, and discuss the application value of NAT in HIV screening, and provide the basis for improving blood safety.

Methods: Routine detection for HIV was conducted on 56684 blood donor screening samples from March 2014 to 2015 in Inner Mongolia Blood Center by FAME3420 system and THORIS system, of which, screening positive samples sent to the Inner Mongolia CDC to confirm the test.

Results: A total of 11 cases were confirmed positive, of which 2 cases were ELISA (+), Western Blot(–), male. After 2 weeks, male, ELISA (+) and WB were uncertain, and WB was confirmed as positive after 4 weeks.

Summary/Conclusions: In order to ensure the quality of blood and the safety of blood transfusion, the laboratory quality management and the test sensitivity must be strengthened. In addition,AIDS-related knowledge should be propagated among young man and applied to the prevention effort on HIV infection.
P-320 ASSESSMENT OF RESIDUAL RISK OF HIV TRANSMISSION VIA TRANSFUSION AFTER BLOOD SCREENING IN TAIYUAN
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Abstract: Because of the window period of enzyme-linked immunosorbent assay (ELISA) and nucleic acid detection (NAT), limited detection reagent sensitivity, virus strain mutation, silent infection, immune detection system error and other factors, screening for blood related viruses will have a certain risk. Residual risk assessment for transfusion-transmitted diseases was a statistical analysis of this risk by retrospective and direct measures. In 2000, WHO recommended the mathematical model of the Australian National Reference Laboratory (NRL) and the American Red Cross to the global blood transfusion service. Because of differences in blood donors and testing levels, developing countries have reported relatively little about it. There were some reports about the residual risk of blood transfusion in China, but there were some differences in the results due to the differences in economic development, prevalence rate and infection rate of diseases. The study used mathematical models to assess the residual risk of HIV transmission via transfusion in our region, with the aim of increasing vigilance against residual risk.

Aims: To review the infection status of AIDS virus (HIV) among voluntary blood donors in Taiyuan, and assess the residual risk of HIV transmission via transfusion after blood screening.

Methods: The HIV test results of voluntary blood donors from 2013 to 2016 were analyzed retrospectively. To compare the incidence rate of reactivity of initial blood donors and repeated blood donors between male and female, with the prevalence rate or window period mathematical model to evaluate the residual risk.

Results: The blood samples of voluntary blood donors amounted to 346,565 in 4 years. The positive rate of HIV was 0.08% among male initial blood donors, 0.01% among female initial blood donors, 0.04% among male repeated blood donors, and 0.002% among female repeated blood donors. The total residual risk of HIV for voluntary blood donors after anti-HIV screening was 2.19 × 10⁻⁴, of which 2.08 × 10⁻⁴ for male and 1.04 × 10⁻⁴ for female, 1.40 × 10⁻⁴ for initial blood donors and 7.88 × 10⁻⁵ for repeated blood donors.

Summary/Conclusions: The prevalence rate of initial blood donors’ HIV infection was higher than that of repeated blood donors’, male donors’ was higher than female donors’ in Taiyuan. The residual risk of HIV transmission of male donors was greater than that of female donors’, and initial blood donors’ was greater than that of repeated blood donors’ in current condition.

P-321 PREVALENCE OF HIV AMONG BLOOD DONORS AND THE ANALYSIS OF SCREENING AND CONFIRMATORY TEST RESULTS IN CHONGQING
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Background: Enzyme linked immunosorbent assay (ELISA) has simple operation and high sensitivity. It is widely used in blood screening in the field of blood transfusion. Anti-HIV screening ELISA kit is a variety of HIV antigen reaction to microtiter plates, as long as the detected and antibody antigen binding was judged as positive, the sensitivity is high, there may be a false positive, so we must use confirmatory test specificity for further detection. The Western blot test (WB) is a method of HIV infection identification prescribed by the national technical standard for AIDS detection (2015 Edition), and its specificity is higher than that of ELISA. Therefore, the ratio of false positive to the positive reaction of screening test and positive proof can be analyzed, and the relation between the result of preliminary screening and the result of confirmatory test is compared.

Aims: To investigate the prevalence of HIV among blood donors in Chongqing and analyze the relationship between HIV screening test results and confirmatory test results.

Methods: Blood donors’ samples were screened with homebred or imported reagents by enzyme-linked immunosorbent assay from January 2014 to December 2015 in Chongqing Blood Center. The samples were sent to Centers for Disease Control (CDC) to conduct confirmatory test as long as positive or gray area by any of the two reagents in screening test. HIV positive incidence rate was calculated and the correlation between screening and confirming test results was analyzed.

Results: During the study period there were 950 HIV positive cases in screening test among 244,454 donors, including 169 positive cases in the double reagents test, among which, 154 cases (91.1%) were positive, 2 cases (1.1%) were uncertain and 4 cases (2.3%) were negative in the confirmatory test. HIV infection rate in blood donors of Chongqing was 0.06%.

Summary/Conclusions: The positive result in the double reagents test is remarkable positively associated with the confirmatory test.

P-322 SURVEILLANCE OF HIV INFECTION IN BLOOD DONORS IN PAKISTAN: A SYSTEMATIC REVIEW AND META-ANALYSIS
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Background: Human Immune Deficiency Virus (HIV) epidemic is an increasing health concern in Pakistan. The mode of HIV transmission largely remains heterosexual followed by blood transfusion. In Pakistan, HIV screening is mandatory under the blood safety legislations. The national strategies to minimize the risk of HIV transmission are the use of behavioral screening questionnaires to defer donors at higher risk of HIV infection and screening the blood with highly sensitive and specific laboratory tests. Assessing the pattern of HIV in a blood donor is necessary to ensure blood safety and also to inform the policy makers on the magnitude of the disease in the apparently healthy population.

Aims: To assess the prevalence of HIV among the healthy blood donor population of Islamabad Capital Territory and its catchment area. A literature search was done to compare the results with the previously reported statistics from across the country.

Methods: This study was conducted at the Shaheed Zulfiqar Ali Bhutto Medical University Hospital Blood Bank, Islamabad, from Jan 2015 – Dec 2016. Blood donors were screened for the prevalence of HIV from Jan 2015 – Dec 2016, by chemiluminescence immunoassay on the fully automated Architect i2000 system (Abbott Laboratories, Abbott Park, IL, USA). The results of the study were compared with the previous 10 years data of the same centre to see the trend over this period. A comprehensive literature survey was done to shortlist national/local studies with similar experimental settings, for subsequent comparison of HIV prevalence results among blood donors. Meta-analyses were gathered from the reported HIV incidence in blood donors from across Pakistan during 1988–2016 by searching through Google, PubMed, and PakMedNet (for Pakistan non-indexed journals).

Results: A total of 54,877 blood donors were tested for the presence of antibodies to the HIV during these 24 months. Of these donors, 54,454 (99.23%) were males and 423 (0.77%) were females. Out of them, 77 were found initially reactive for HIV. The repeat testing resulted in 75 (0.13%) positive donors, 99% CI 0.0014 (0.0011 – 0.0018). All positive donors were males. The prevalence of HIV positivity during the last 11 years period (2006–2016) showed a significant change over a period of time through the chi square goodness of fit test. The mean prevalence was 0.06%. The mean prevalence of HIV from 2006–2016 was 0.06% while 0.13% in 47 studies conducted during the period 1988–2016.

Summary/Conclusions: The prevalence of HIV in apparently healthy blood donors is steadily increasing in Pakistan. Specific recommendations include the availability of a sufficient volunteer blood donor pool and adequate blood donor screening, information, counseling, and confidentiality. Implementation of standardized screening protocol and use of highly sensitive tests will reduce the risk of transmission.

P-323 ANALYSIS OF HIV INFECTION IN VOLUNTARY BLOOD DONORS IN WUHAN
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Background: HIV [Acquired Immune Deficiency Syndrome] is a kind of infectious disease which seriously endangers human health. Its incidence rate is rising in our country and the world. HIV is one of the infectious diseases that our country focuses on. The Wuhan has reported HIV infection rates increased year by year. Screening of HIV antibodies for voluntary blood donors is one of the mandatory testing items for blood quality assurance.

Aims: Analysis of HIV infection in voluntary blood donors in Wuhan.

Methods: We analyzed 118867 samples which were from voluntary blood donation in Wuhan at first half of 2017. If a sample was positive or single reagent diplopora
retest was positive, we will send it to Wuhan City CDC confirmed. We had sent 176 samples (118 males and 58 females) to CDC.

Results: 191 samples were collected from HIV-positive donors, 37 were negative, 3 were indeterminate, and 85 were positive. 19 HIV-positive samples were sent to Center for Disease Control and Prevention (CDC) for further identification.

P-325

HIV, HCV, AND SYPHILIS CO-INFECTIONS AMONG HIV POSITIVE BLOOD DONORS IN BLOOD CENTER OF ZHEJIANG PROVINCE, CHINA: A RETROSPECTIVE ANALYSIS
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Background: Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and syphilis still cause high burdens of disease in China. Aims: The objective of the study was to assess the risk of co-infections with HBV, HCV, and syphilis among HIV-positive blood donors in Blood Center of Zhejiang Province to find out characteristic of these donors.

Methods: In this study, we reviewed data from 2,221,131 blood donations in Zhejiang Blood Centre between January 1999 and July 2017. All donations were tested for anti-HIV, HBsAg, anti-HCV and syphilis by serological screening. NAT assay was added since August 2010, and then 956,317 donations were tested for HBV, HCV and HIV. HIV reactive samples were sent to Center for Disease Control and Prevention (CDC) for further identification.

Results: Among the 2,221,131 blood donations, we found that 27% donors were confirmed with HIV infection by CDC using Western blot. Of these 275 HIV-positive donors, 12% (33 cases, confirmed between 2007 and 2017) was HIV-syphilis co-infected, 2.2% (5 cases, confirmed between 2001 and 2003, 1 case, confirmed in 2014) was HIV-HCV co-infected and 0.4% (1 case, confirmed in 2009) was HIV-HBV-syphilis co-infected. CDC’s investigation found that all these HIV-syphilis co-infected cases related with sexual transmission. Eighteen of them (54.5%) associated with men who have sex with men (MSM), and the other fifteen (45.5%) associated with commercial heterosexual sex.

Summary/Conclusions: There was a high prevalence of HIV-syphilis co-infection in HIV positive donors, suggested that sexual transmission was becoming the leading route of HIV infection in China, replacing intravenous drug abuse or history of blood donation.

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Abstract has been withdrawn

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FOLLOW-UP AND THOUGHTS ON THE PROCESS OF HIV ANTIBODY SEROCONVERSION ON A VOLUNTARY BLOOD DONOR
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Background: Hainan area blood donors of anti HIV positive rate increased, and the young men is the main feature, and in January 19, 2017, the general office of the State Council issued the “China AIDS prevention and containment” 11th Five-Year "action plan" to elucidate the epidemic of AIDS in China is consistent with the trend, increasing the number of people HIV latent infection free blood donation, a great threat blood safety, from low risk blood donors in recruiting blood donors, blood donation of blood donors were detected by HIV, is an important strategy to ensure the safety of blood.

Aims: To analyze the status of the process of blood donors’ HIV infection and seroconversion, to discuss the influence from uncertain factors in Centralized detection mode on early-stage transfusion-transmitted diseases, and to provide evidence and support for a more scientific blood management method.

Methods: Conduct Routine test, Verification test and validation test on a primary blood sample and a Follow-up blood sample of a blood donor with ELISA, NAT, and WB.

Results: Regarding the primary blood sample, the results from the Routine test and Verification test, the 3rd generation ELISA Test kit on HIV were all negative; the result from the 4th generation Antigen antibody combined detection reagent was positive; and the result for antibody from WB was uncertain. Regarding the Follow-up blood sample after 4 weeks, the result from 3rd and 4th ELISA Test kit were strongly positive; the result from HIV RNA was relatively strong; and the result from WB was positive.
Summary/Conclusions: The application of 4th ELISA Antigen antibody combined detection reagent and NAT has successfully shortened the HIV detection window period. The management and supervision of blood sampling and blood supply should be improved. The transmission of HIV through transfusion can be contained and the safety risk of blood can be minimized by recruiting blood donors from low risk population.

Bacteria

P-128
BACTERIAL CONTAMINATIONS OF PLATELET PRODUCTS IN DONGGUAN BLOOD CENTER
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Background: Platelet products pose a special risk of bacterial contamination due to their preservation and collection methods. Aims: After five prevention measures were taken, the incidence of bacterial contamination of platelet products needs to be assessed to accurately manage the risk of transfusion-transmitted bacterial infection. Methods: 28711 platelet product's samples from Dongguan Blood Center were examined by bacterial culture tests including initial culture and subculture, if initial culture was positive, subculture was performed, and bacterial identification was needed if subculture was positive. 3071 platelet samples were examined in 2006. From 2007 to 2016, four prevention measures were taken, including sterilizing donation environment, screening donors, depleting white blood cells from pooled platelet, and remove the first 15 ml of collected platelet, a total of 25638 platelet samples were examined. Bacterial culture of recipients and transfused bag for checking the cause of platelet transfusion adverse reactions was performed in hospitals of Dongguan.

Results: 63 (0.22%) positive cases in 28711 platelet samples were found to be contaminated with bacteria from 2006 to 2016. In 2006, the positive rates of pooled platelets and apheresis platelets were 0.72% and 0.47%, respectively. After 2007, four prevention measures were taken, the positive rates of pooled platelets and apheresis platelets brought down to 0.33% and 0.14%, respectively. From 2006 to 2016, a total of 44 positive reaction platelet samples were identified. The isolated bacteria include coccus, bacillus, aspergillus and anaerobic stains. 13 cases of platelet products in 2006 and 37 cases from 2007 to 2016, which were happened platelet transfused bag were taken bacterial cultures, none had bacterial contamination.

Summary/Conclusions: Our study underlines the need for taking prevention measures can further reduce the risk of platelet transfusion-associated bacterial infections, bacterial culture of platelet products is limited.

P-329
THE PRELIMINARY ESTABLISHMENT AND APPLICATION OF QUALITY CONTROL EVALUATION METHOD OF BLOOD COMPONENT BACTERIA TESTING
Y Chen and H Pan

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Background: According to the preparation of 1% per month or 4 bags of various blood components for bacteria detection, because of fewer, and sustained an annual does not appear more has the phenomenon of bacterial growth, the results, to strengthen the quality of blood component samples bacteria detection process control is necessary. Aims: To ensure the accuracy, reliability and validity of the results of bacterial detection of blood components. Methods: By joining the evaluation activities of blood component bacteria testing of CDC, analysis of microorganism culture monitoring system instrument on a regular performance of the instrument and the same strain of different concentrations and different strains of bacteria detection ability, realize self assessment, and to continuous monitoring of laboratory detection ability, to improve its ability of detection. Establish a concentration of 10 cfu/ml staphylococcus aureus, or concentration of 50 cfu/ml E. coli, such as standard strain single bacteria as low concentrations of bacteria detection of internal control, set conditions as follows: the qualitative results for the "+", check out time < 24 h. At the same time, bacterial detection was carried out parallel to conventional blood component samples. Results: The coincidence rate of the results of the three bacterial test rooms in 2016 is 100%. The conformity rate of the first time in 2017 is 90%; The reason for leak detection is extremely low concentration of "educational" sample E (aspergillus Niger, 10 cfu/ml), which was not detected in the PBA bottle culture of the microbial culture monitoring system for 7 days; The SI value of the positive sample is <$ 2, the optimal rate of time distribution is 100%, and the detection value is controlled in the "mean plus or minus 2SD" range. In routine work, the qualitative results of BFP in low-concentration bacterial detection are "+ +", and the detection time (h) is 13.92 + 1.84; The qualitative results of BPN are "+ +" and the detection time (h) is 13.48+ 2.49, which met the expected requirements of its setting. Between January 2016 and July 2017, we tested the samples of 398 bags of blood ingredients, and the test results of the oxygen culture bottle (BPA) and anaerobic culture bottle (BPN) are all qualified.

Summary/Conclusions: Through the coincidence rate of the results of the interventional quality assessment report and the time of detection, objective to evaluate the laboratory's ability to detect the bacterial contamination of the blood components, and to carry out continuous monitoring and improvement of the laboratory. The method of detecting internal control with low concentration bacteria is established, and the quality control of each experiment is effectively carried out to ensure the correctness, reliability and validity of the experimental results.

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RESEARCH ON THE POTENTIAL RISK OF TRANSFUSION-TRANSMITTED BRUCELLOSIS IN BEIJING
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Background: Brucellosis is a worldwide zoonosis,which has great economic importance. The major source of infection for brucellosis is the infected domestic animals. There are some reports regarding brucellosis can survive well in stored blood. Brucellosis is now endemic in 25 provinces of China, and also increasing in some areas of Beijing. The positive rate of brucellosis was 6.91% in Huairou, 0.35% in Changping, and increased from 0 in 2008 to 1.72% in 2013 in Fanggou. Screening of brucellosis is now endemic in 25 provinces of China, and also increasing in some areas of Beijing. The positive rate of brucellosis was 6.91% in Huairou, 0.35% in Changping, and increased from 0 in 2008 to 1.72% in 2013 in Fanggou. Screening of brucellosis in Beijing and surrounding areas is of great significance to the safety of blood. It is necessary to investigate the prevalence of brucellosis among healthy blood donors in Beijing.

Aims: The aim of this study was to investigate the prevalence of brucellosis among healthy blood donors in Beijing, and explore the potential risk of transmission of brucellosis.

Methods: Randomly selected 2657 healthy donors, collect by Tongzhou Center Blood Station from July 2016 to January 2017. Rose Bengal Plate Agglutination Test(RBPT) and Standard Tube Agglutination Test(STAT) were used to detect brucella antibody, and positive samples of the two methods were detected by ELISA.

Results: In 2657 samples, RBPT was positive in 4 cases(0.15%), degree of aggregation are "+++", SAT was positive in 4 cases(0.15%), 3 cases with SAT titer >1:100 (+++), 1 case SAT titer >1:200 (+++), including 2 cases of SAT/RBPT positive. The other 22 cases detected by SAT were suspicious samples, SAT titer >1:50 (++). 1 cases with ELISA positive (0.04%), OD>1.200, the concentration is 670.875 ng/l. Among SAT positive and suspicious samples: female> male (P < 0.005), pastoral areas > other areas (P < 0.005), the difference was statistically significant.

Summary/Conclusions: It is important for the safety of blood with a strict health consultation for blood donors who are infected with Brucellosis, and Brucella blood screening would carried out in Brucellosis endemic areas.

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Parasites

P-331
PREVALENCE OF HAEMOPARASITES AMONG BLOOD DONORS IN NAKASERO BLOOD BANK
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Background: Haemoparasites can be a potential threat once found in a donor's blood. However, the prevalence of parasitic infections especially haemoparasites is a serious case which needs to be addressed, some diseases resulting from parasites during the transfusion race due to fatality among which filarial worms, malaria parasites, trypanosomes has been reported to cause. It is also stated that trypanosomiasis are found in Africa though the prevalence is very low among the donors as compared to other haemoparasites.

Aims: The objective of the study was to determine the proportion of haemoparasites donated in Nakasero blood bank, Uganda.

Methods: A cross sectional study was carried out at Nakasero blood bank between the months of April and July 2016. About 2 ml of venous blood samples were collected into an Ethylene Diamine tetra acetic acid (EDTA) containing bottles for the study. Aseptic technique was used during the blood collection to prevent any blood contamination.

Results: Out of 384 samples, Positive for Haemoparasite species were 22 (5.7%), the rest being negative 362 (94.3%). Of the proportion of Haemoparasites, Plasmodium species were 16 (7.2%) as per thin film, Microfilaria species 6 (27.3%) were positive. The number of male positive for haemoparasites was 15 (68.2%) and females were 7 (31.8%). Of the proportion of Haemoparasites, Plasmodium species were 16 (72.7%) as per thin film, Microfilaria species 6 (27.3%) were positive. No trypanosome species were seen.

Summary/Conclusions: Malaria parasite is the most prominent haemoparasite in Nakasero blood bank with a higher prevalence in male than female. There was insignifiant prevalence of microfilaria and much less insignificant in Trypanosomes.

INVESTIGATION OF BABESIA MICROTI SEROPOSITIVITY BY IN-HOUSE ELISA KITS IN BLOOD DONORS
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Background: The tick-borne pathogen Babesia spp. has become recognized as the leading infectious risk associated with blood transfusion in the United States. Transfusion transmitted Babesia spp. cases were also reported in some countries. In China, there were some investigations of Babesia spp. infection on normal populations in several regions and the current status of the pathogen is insufficiently evaluated. No commercial reagents to screen Babesia spp. are available and there is limited data regarding Babesia spp. infections in blood donors in China.

Aims: The aim of this study was to evaluate the seropositivity of Babesia microti in blood donors in Jiangsu, eastern China.

Methods: An investigational in-house enzyme immunoassay (EIA) kits for B. microti in a screening test were used in donors' blood samples from March to May 2017 in Jiangsu Province Blood Center. The applied specific human immunoglobulin-U ultra targetting peptides derived from B. microti secreted antigen 1 (BmS1A) were coated as antigen in this house optimized ELISA. The EIA positive samples were confirmed by western blot (WB) and nested-PCR targeted 18S ribosomal RNA gene.

Results: Total 950 blood donor's samples including 649 male and 301 female donors were screened and 5 (3 male and 2 female) were positive for BmS1A. Four of them were local residents and one was from other province. The five samples were positive by WB, but they were all negative by nested-PCR.

Summary/Conclusions: This investigation showed that there is B. microti infection in blood donors in Jiangsu province. However, larger scale, multicenter studies should be conducted to further evaluates the epidemiology of B. microti infections in Chinese blood donors.

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Newly Emerging Pathogens and Other Transfusion Related Pathogens

P-334
NO EVIDENCE OF NOVEL HUMAN PEGIVIRUS 2 ACTIVE INFECTION IN HCV-INFECTED BLOOD DONORS FROM FRANCE AND CHINA
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Background: A novel bloodborne human pegivirus, tentatively named human hepe- givirus 1 (HPgV-1) or human pegivirus 2 (HPgV-2) was recently identified in multi-transfused and hepatitis C virus (HCV)-infected patients and intravenous drug users from the US and UK. Identification of this virus in post-transfusion samples of blood product recipients suggested a potential risk of blood transmission, although the pathogenicity of this virus remains unknown. HPgV-2 active infection prevalence is largely unknown due to the limited number of studies conducted on selected populations and the lack of standardized serologic and molecular screening assays.

Aims: To investigate active HPgV-2 infection in blood donors originating from Western Europe and Asia.

Methods: HPgV-2 RNA detection was performed using a one-step TaqMan-based real-time RT-qPCR assay using primers/probe targeting the NS2-3 region as previously described. Partial NS2-3 sequence derived from the HPgV-2 prototype sequence (GenBank KT493229) was in vitro synthesized and used as control in the RT-qPCR assay (limit of detection: 100 RNA copies/reaction).

Results: HPgV-2 RNA was investigated by RT-qPCR in 1,123 plasma samples from HCV-infected (666 HCV RNA+/anti-HCV Ab+ and 467 HCV RNA-/anti-HCV Ab+) and 94 non-infected blood donors collected in France and China between years 2007–2016. Intravenous drug (IVD) injection was reported for 114 (18%) of 636/860 donors from France and China may be related to lower prevalence compared to those reported in donors (1%) and IVD users (10.9%) from US, possibly related to a lack of sensitivity of the method. Genetic diversity of HPgV-2 strains of different geographical origins may negatively affect RNA detection since a ~5% nucleotide diversity was observed between the North American HPgV-1 (HpgV-1) and HPgV-2 sequences available. However, nucleotide substitutions in the reverse primer and/or probe annealing sites did not impact on detection.

Summary/Conclusions: Absence of detectable HPgV-2 RNA in HCV-infected blood donors from France and China may be related to lower prevalence compared to those reported in donors (~1%) and IVD users (10.9%) from US, possibly related to difference in exposure. However, HPgV-2 exposure in blood donors might be underestimated due to the inability to serologically detect potential recovered infections as a validated immunoassay is currently unavailable. Further investigations using larger cohorts and standardized sensitive assays are required to determine the global epidemiology and the natural history of this new virus to estimate its potential pathogenicity but nowadays impact on blood safety seems limited.

Abstract has been withdrawn

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METAGENOMICS ANALYSIS OF HEALTHY BLOOD DONORS IN CHONGQING OF WESTERN CHINA, WITH IDENTIFICATION OF EMERGING INFECTIOUS DISEASES

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Background: Many emerging infectious pathogens are known to be existed in healthy blood donors, and could be transmitted via blood transfusion or plasma derivatives with potential hazardous consequences against recipients. With more convenient application of high through put sequencing, it becomes much easier to identify uncultured microbiomes in qualified blood donations to identify the pathogens.

Aims: To explore the role of USP18 in IFN resistance of DENV.

Methods: We screened anti-HEV IgG, IgM and HEV antigen in 3044 plasma samples using enzyme linked immunosorbent assay (ELISA). Samples with the presence of anti-HEV IgM or HEV antigen were further tested for HEV RNA by quantitative real-time PCR.

Results: The seroprevalence of anti-HEV IgG, IgM antigen and IgM was 20.04% (610/3044), 0.90% (27/3044) and 0.03% (1/3044), respectively. However, the HEV RNA was undetectable in all anti-HEV IgM or HEV antigen positive samples.

Summary/Conclusions: The background of healthy blood donors in Guangzhou city of China. Aims: To explore the role of USP18 in IFN resistance of DENV.

Methods: Silencing of USP18 activated the IFNα-mediated Jak/STAT signaling pathway as shown by the increased expression of p-STAT1, enhanced ISRE activity, and ISG expression (real-time PCR).

Results: DENV infection led to the increased expression of USP18. siRNA specifically targeted against USP18 in Hela cells infected with DENV make the DENV more sensitive to IFN treatment as shown by the fact that 70% lower level of DENV RNA replication if the cells were pre-treated with IFNs prior to infection, while cells infected with DENV first developed IFN resistance. The underlying molecular mechanism remains unclear. Ubiquitin-specific protease 18 (USP18) is a negative regulator of the type-I IFN signaling and increased expression of USP18 could serve as a potential target for developing novel therapeutic agents against DENV, and potentially other viruses' infections.
Background: Infection with HTLV-L, though asymptomatic in most cases, can lead to potentially grave consequences, such as adult T-cell leukemia-lymphoma and HTLV-1-associated myelopathy/tropical spastic paraparesis. Association of HTLV-II with leukemia pathogenesis is not established; however, there is some evidence of an association with a neuro-degenerative disease similar to HAM/TSP and occasionally with lymphoproliferative disease. Both viruses may be transmitted by whole blood transfusion, from mother to child predominantly through breastfeeding, and by sexual contact. Very little is known about HTLV prevalence among blood donors in Vietnam and hence routine pretransfusion screening for HTLV has not been mandatory in the country until now.

Aims: The study was designed to investigate the seroprevalence of HTLV-I/II among Vietnamese blood donors.

Methods: Total of 14,819 samples from healthy blood donors from the Northern, Central and Southern parts of Vietnam and another 1,003 samples from blood donors who were found reactive with one or more markers including HBsAg/anti-HCV/HIV were included in the study with informed consent. The blood samples were screened for anti-HTLV-I/II antibodies by Chemi-Luminescence Immuno-Assay (CLIA) using Abbott Architect HTLV-I/II assay. The anti-HTLV-I/II reactive samples were further tested by immunoblot method using MP Biomedicals HTLV Blot 2.4 for confirmation and differentiation of HTLV-I/II infection. Pro-viral HTLV genome testing was performed on the available whole blood whole blood reactive samples (N = 11). The data was analyzed with MS Excel and SPSS 22.0.

Results: Among 14,819 blood donors, 32 samples (0.22%) were reported reactive with anti-HTLV-I/II Screening assay, but only 1 case was confirmed positive (0.0067%), and 5 cases were classified as indeterminate (0.034%) on immunoblot. The rate of repeat reactive anti-HTLV-I/II samples was 0.399% among samples from blood donors who were reactive with HBsAg/anti-HCV/HIV markers, but none of them were confirmed by MP Biomedicals HTLV Blot 2.4. Further confirmatory testing of N = 11 repeat reactive whole blood samples was performed by pro-viral HTLV gag and tat region molecular characterization but none of them were confirmed. The whole blood samples from the donors that exhibited positive reactivity on MP Biomedical HTLV 2.4 blot as well as one donor with indeterminate blot results were not available for further molecular characterization.

Summary/Conclusions: HTLV-I/II prevalence was found to be low among blood donors in Vietnam in this study. However, continuing efforts to monitor the infection trends and paying attention to key regions to control high-risk transmission for a safe blood transfusion is recommended.
of MC MV recurrence in the livers of animals overexpressing two miRNAs agomirs in Group 2 than in the control livers, confirming the antiviral effects of viral miRNA manipulation in vivo.

Summary/Conclusions: Thus, the manipulation of viral miRNA expression is an attractive potential therapy and represents a novel antiviral strategy for the miRNA-based treatment of cytomegalovirus infection.

P-346
INVESTIGATION OF THE SIGNIFICANCE OF ALT SCREENING IN VOLUNTEER BLOOD DONORS UNDER THE CONDITION OF PERFORMING HBV/HCV NUCLEIC ACID TESTING
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Background: With the development of nucleic acid detection technology, more and more discussions have been made about whether to cancel ALT detection or not, now re-evaluating the importance of ALT testing for blood safety improvement after nuclear acid testing.

Aims: By analyzing the different range of Alanine aminotransferase (ALT) levels in donor samples to re-evaluate the importance of ALT testing for blood safety improvement after nuclear acid testing.

Methods: 148118 blood donors were collected in Changsha blood center during 2016 and 2017 by rate method for detecting ALT, all samples were analyzed by ELISA, NAT and ALT testing, among which ALT unqualified ones were investigated retrospectively.

Results: Among 148118 samples, 859 samples were found ALT unqualified of which 4 samples were HBsAg and HBV DNA positive, 3 samples disqualify, comparing the ALT deferral rate with the ALT deferral rate of HBsAg and anti-HCV, the difference was statistically significant (P < 0.05). There were no samples of ALT disqualified and positive for HBV DNA and one sample positive for HCV RNA. Among 8 samples of normal ALT and negative ELISA results but positive for HBV DNA, 847 samples which were only ALT unqualified experienced a retrospective investigation, among which 60 samples were donors who had been previously ALT unqualified for many times.

Summary/Conclusions: ALT testing plays a role to reduce residual risk of transfusion-transmitted diseases. NAT testing can obviously reduce HBV leakage of ELISA screening.

P-347
EVALUATION OF THE SENSITIVITY AND SPECIFICITY OF COBAS® CHIKV/DENV
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Background: Arboviruses such as chikungunya virus (CHIKV) and dengue virus (DENV) are a public health concern. Transfusion-transmitted (TT) DENV has been reported in Asia, South America and the Caribbean; no TT-CHIKV has yet been reported. Currently, no duplex test for CHIKV and DENV is not commercially available for blood screening.

Aims: To perform an external evaluation of the analytical sensitivity and clinical specificity of cobas® CHIKV/DENV.

Methods: Testing was performed on a cobas® 8800 System at the American Red Cross. Analytical sensitivity: Evaluated using randomized panels prepared from serial dilutions of CHIKV and DENV heat-inactivated culture isolates (CHIKV concentrations traceable to 2014 CBER panel; DENV to 2013 DENV-1 serotype CBER panel). Multiple dilution series of co-formulated CHIKV and DENV at 5 concentrations (from approximately 0.125 x 2 ≤ x 99% limit of detection LOD)), and negative panel members were tested. Each concentration (24 replicates of each) was tested with 3 reagent lots. Results were used to calculate the LOD for each target by Probit Analysis. For each viral target, the estimated LOD from the combined lots was compared to the LOD claim for cobas® CHIKV/DENV (difference of log₁₀ LODs (estimated – claimed) to be ≤ 0.3).

Clinical specificity: Samples from >10,000 US volunteer donations were de-identified and tested by individual donor testing with cobas® CHIKV/DENV. Reactive samples were to be tested by alternative NAT and evaluation of amplicon by hemi-nested PCR or probe fragment hydrolysis. A reactive result on cobas® CHIKV/DENV would be considered a true positive if the additional testing was positive. Specificity of cobas® CHIKV/DENV was calculated as the percentage of CHIKV/DENV RNA negative samples that were non-reactive.

Results: The percentages of reactive results with the LOD panels across 3 lots were 12.5% (~0.125 x LOD), 44.4% (~0.25 x LOD), 59.7% (~0.5 x LOD), 90.3% (~1 x LOD) and 98.6% (~2 x LOD) for CHIKV positive samples. The percentages of reactive results were 41.1% (~0.125 x LOD), 65.3% (~0.25 x LOD), 88.8% (~0.5 x LOD), 100% (~1 x LOD) and 100% (~2 x LOD) for DENV positive samples. Negative panel members were nonreactive. The estimated 95% LOD for CHIKV was 10.5 CBER NAT Detectable Units/ml (95% CI: 8.2 to 14.6 CBER NDU/ml). The estimated 95% LOD for DENV was 52.8 PCR Detectable Units/ml (95% CI: 41.6-75.4 PDU/ml). Difference of estimated minus claimed results was ~0.2 logs and ~0.1 logs for CHIKV and DENV, respectfully.

There were no donations with cobas® CHIKV/DENV-reactive results. The prevalence of CHIKV/DENV reactive results in US donations was 0% (0/51,528, 95% Exact CI: 0% to 0.019%). The specificity of the cobas® CHIKV/DENV test was 100% (95% Exact CI: 99.965% to 100.000%) for both the CHIKV and DENV targets.

Summary/Conclusions: The analytical sensitivity for both the CHIKV and DENV targets was comparable to the manufacturer’s claim.

None of the US donations in this study were reactive with the cobas® CHIKV/DENV test.

The 100% clinical specificity demonstrated in this study supports the use of cobas® CHIKV/DENV as a blood donation screening test for CHIKV and DENV RNA. cobas® CHIKV/DENV for use on the cobas® 6800/8800 Systems is not commercially available.

P-348
PREVALENCE OF HUMAN PARVOVIRUS B19 AND HUMAN PARVOVIRUS 4 IN BLOOD DONORS OF XI’AN, CHINA
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Background: Human parvovirus B19 (B19V) and human parvovirus 4 (PARV4) are parvoviruses known to infect humans and transmit through the contaminated blood and plasma derived medicinal products (PDMPs). B19V infection is associated with a spectrum of clinical manifestations and could provoke serious complications in some high-risk groups. Although the clinical significance of PARV4 infection remains uncertain, a variety of clinical associations have been reported. PARV4 infection commonly associated with intravenous drug use and serosopositivity of blood-borne viruses has also been documented in Northern Europe, the United States and Asia. However, studies concerning the existence and loading of B19V and PARV4 in Chinese blood donors, especially in Northwestern China, were limited.

Aims: To evaluate the prevalence of B19V and PARV4 in blood donors of Xi’an.

Methods: A total of 2000 plasma donations were collected between 2015 and 2016 from Xi’an. Each sample was tested for aminotransferase (ALT) and anti-syphilis, anti-HIV 1/2, HBsAg and anti-HCV and has been confirmed to be qualified according to the requirements of Pharmacopeia of the People’s Republic of China. Aliquots of plasma from 10 human blood donations were pooled and subjected to nucleic acid extraction using the High Pure Viral Nucleic Acid Kit (Roche Diagnostics, Mannheim, Germany), according to manufacturer’s instructions. Then, a multiplex quantitative real-time PCR (qPCR) assay was performed to detect and quantify all three genotypes of B19V and PARV4 DNA in these samples.

Results: Of 2000 blood donors, 9 (0.45%) specimens were found positive for B19 DNA and all specimens were negative for PARV4. The quantitative DNA levels of B19V ranged from 6.80 x 10⁻⁶ to 1.69 x 10⁴ copies/ml.

Summary/Conclusions: PARV4 exhibited significantly lower infection rates than B19V among blood donors of Xi’an. This result was similar to those observed in other studies obtained from the donor population of the Chinese mainland. This study, to some extent, provided a basis for improving blood safety and preventing B19V and PARV4 infection in China. Larger studies are needed to investigate the prevalence of B19V and PARV4 in Chinese blood donors.
INVESTIGATION ON IRREGULAR ANTIBODIES OF RED BLOOD CELL OF PATIENTS WITH β-THALASSEMIA MAJOR IN LI NATIONALITIES IN HAINAN, CHINA

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Background: Thalassemia was once a major health problem in Hainan, especially in Li nationalities. Although regular blood transfusion is an important measure to maintain the life quality of patients with thalassemia, Side effects such as red blood cell(RBC) alloimmunization may be caused. RBC alloimmunization antibody detection rate was 9.64%, 9.4% and 23.0% among the Chinese thalassemia patients requiring long-term transfusion in Shenzhen, Hong Kong and Taiwan. There have been no reports of RBC alloimmunization about the patients with β-Thalassemia Major in Li nationalities in Hainan. The purpose of this study was to investigate its prevalence among Li β-Thalassemia major patients.

Aims: To investigate the irregular antibodies of red blood cell for β-Thalassemia Major patients with long-term transfusion in Thalassemia high incidence population-Li nationalities in Hainan, so as find Corresponding measures to reduce the occurrence of irregular antibodies and make transfusion safe and effective.

Methods: The peripheral blood from 113 β-Thalassemia Major patients with long-term transfusion was collected. The irregular antibodies were screened and identified by saline test, polyethylene tube test and indirect antiglobulin test.

Results: The positive rate of irregular antibody was 9.73% (11/113), focused mainly on Rh system antibody (9/11), including anti-E(9/9), anti–E and anti–c(4/9), the other two cases are anti-K and anti-Lea.

Summary/Conclusions: Such patients should be given multiple antigen compatible blood, especially Rh E, c to reduce the high occurrence of Rh system antibody on the base of ABO, RhD matched transfusion.

RED BLOOD CELL ALLO-IMMUNIZATION IN IRAQ, A COMPREHENSIVE REVIEW OF THE LITERATURE

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Background: In most blood transfusion services, phenotyping and pre-transfusion compatibility of the most immunogenic antigens are normally applied to patients that require regular transfusion. However, the risk of alloantibody development still remains a big challenge, particularly in developing countries like Iran, where high costs of pre transfusion phenotyping do not allow it to be a part of routine transfusion procedure.

Aims: In the current study we tried to have a comprehensive review on the status of red blood cell alloimmunization in Iran. For this purpose we searched for papers investigating alloimmunization in transfusion dependent patients and also in patients with no regular transfusions who were candidate for surgery or who needed blood.

Methods: We searched PubMed, Google Scholar, SID, and MAGIRAN data bases using the following keywords: ‘blood transfusion’, ‘alloimmunization’, ‘alloantibodies’, ‘irregular antibodies’, ‘red cell antibodies’, and ‘Iran’. No limitation for the date of publication was defined and studies in either Persian or English languages were included. All the identified records were then screened for the relevance and duplication.

Results: A total of 22 papers were included in this study. 10 papers were in Persian and 12 in English. All of the studies were conducted from 1999 to 2016 and providing alloimmunization data from different cities all over Iran.

Most of the studies included subjects with β-thalassemia. According to these studies, most of the detected alloantibodies are anti-kell (anti-K antigen) and anti-Rh system antibodies mainly anti-E, anti-D, anti-C, and anti-c.

Three out of 22 studies were conducted on patients without regular transfusions who were candidate for elective surgery. These studies which included a higher number of patients may provide more general data of Iranian population. The incidence of alloimmunization in these patients was 0.8-0.9% and all three papers introduced anti-K, anti-E, anti-C/anti-c as the most common detected antibodies.

Summary/Conclusions: The development of anti-D antibody as one of the most common alloantibodies, shows that we have still problems in blood group typing, because D antigen is one the main antigens which should be matched between donor and recipient especially for young female recipients. This problem may reflect clerical and technical errors made by the staff and also inappropriate or incomplete quality control of the reagents and equipments. Inappropriate methods of antibody detection, lack of standard protocols, and lack of an efficient surveillance system are other causes of alloimmunization in developing countries.

Cross match is another critical step in pre-transfusion testing which may be affected by a wide range of clerical and technical errors; such as mislabeled or partially labeled tubes, misinterpretation of hemolysis in serum grouping as negative and blood group discrepancy due to inadequate washing of cells.

Alloimmunization may also occur because many alloantibodies may not be detected, as no further transfusions are required or because the titer of antibodies decrease over time and reaches a non-detectable level prior to testing. Anyway it is an inevitable outcome of transfusion, since the compatibility of all the transfused antigens is impossible.

Our study with gathering the majority of studies on Iranian population from all over the country may provide an overview on the status of alloimmunization in Iran including the total incidence and the prevalence of responsible antibodies.
P-353
THE PERSISTENCE AND EVANESCENCE OF RED CELL MIMICKING ANTIBODIES IN VIVO
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Background: Red cell mimicking antibodies (combine with autoantibodies specificity, or not combine) may become weak and undetectable over the course of time. They can cause a haemolytic reaction if the blood which contain corresponding antigen positive against mimicking antibody were transfused. So the research of persistence and evanescence of red cell mimicking antibodies is valuable in theory, and can offer valuable data for safe transfusion. Only a few studies have been published on this topic.

Aims: Through detailed research of some cases of mimicking antibodies (combine with autoantibodies specificity, or not combine). To analyze retrospectively and study the characteristics of mimicking antibodies and the rate of mimicking antibodies reduced in the patient’s body. Interpret the clinical significance of the mimicking antibodies is important for patient transfusion management.

Methods: In our research, We detected and collected the cases of patients who produced mimicking antibodies from all of hospitals in Shanghai between 2005 and 2017. Several kinds of mimicking antibodies were tested in laboratory. If the mimicking antibodies were tested again after the first detection, we recorded these antibodies data included the strength of antibodies, the length of follow-up, and calculated the rate of evanescence.

Results: We retrieved the records of 12 antibodies (including mimicking anti-E/C-, Ce/C,-D,-S), which had been tested again after the initial detection, and found that 25.0% were non-persistent in average 29.9 days. The average rate of evanescence of mimicking antibodies is 0.377/per day (0.377 is agglutination reaction strength, see AABB Technical Manual 17th Editions Page: 873-874).

Summary/Conclusions: Mimicking antibodies did not see increased obviously after clinical blood transfusion treatment with red blood cells which have corresponding antigens. And after transfused negative red blood cells, mimicking antibody may became rapidly weakened. Blood transfusion treatment should be as far as possible to avoid mimicking antibody specificity, transfuse corresponding antigen negative of red blood cells will have obvious therapeutic effect on the patients.

P-354
DETERMINATION OF IRREGULAR ANTIBODIES IN DONATED BLOOD AT A TERTIARY CARE CENTER IN RAJASTHAN, INDIA
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Background: Ever increasing efforts at improving blood safety have led to incorporation of regular screening protocols for detection of unexpected/irregular immune antibodies at various transfusion centers across the globe. Knowledge about the frequency of serum antibodies is important to minimize the risk of hemolytic transfusion reactions and to obtain timely and properly matched blood components for transfusion. This requires determination of irregular antibodies present in the serum as a part of immunohematological analysis in addition to ABO-Rh typing and extended phenotyping of red cell surface antigens.

Aims: 1. To generate blood bank donor data base for constitution of panel of blood donors to ensure the safety and effectiveness of clinical blood transfusion.
2. To determine the prevalence and specificity of unexpected/irregular anti-red blood cell antibodies among healthy blood donors, in order to find the rules.
3. To quantify the magnitude and specificity of the problem in the population and initiate measures to screen the population or a selected group in the population.
4. To obtain in-house antibodies from donated plasma for red cell typing to ensure compatible blood units for the patients having irregular antibodies in their serum.

Methods: This prospective study was conducted in the Department of Immuno-Haematology & Transfusion Medicine, Sardar Patel Medical College & Associated Group of Hospitals, Bikaner (Rajasthan), India among healthy blood donors during the period from 1st March, 2017 to 31st July, 2017. Donors’ blood samples were tested for unexpected/irregular red blood cell antibodies [other than anti-A and anti-B antibodies] on automated immunohematology analyzer (Systain Phase Red Cell Agglutination Technology) using commercially prepared pool cells and panel cells (3 and 14 cell panels), along with performing direct and indirect agglutination tests using gel cards (Column Agglutination Technology). SPSS version 16 and MS Excel were used for statistical data analysis.

Results: Out of the total 11,476 donor blood samples screened, presence of irregular antibodies was observed in total 6 samples (0.052%). On antibody identification, 2 samples were detected to have anti-K antibody, 1 sample was found to have anti-D antibody and 3 were detected to be positive for auto-antibodies. The positivity rate of irregular antibodies was found to be significantly higher among female blood donors (0.632%) compared with male blood donors (0.027%) (P = 0.000).

Summary/Conclusions: Determination of clinically significant irregular antibodies in donated blood is very useful for the patients receiving large volumes of plasma or whole blood as in massive blood transfusions and in pediatric patients. Irregular antibodies present in donors’ plasma, upon transfusion, may lead to hemolytic transfusion reactions. These antibodies may cause incompatibility during cross matches causing unnecessary delay in the transfusion. That is why, 100% donated blood units must be tested for the presence of irregular antibodies in their serum as a part of pre-transfusion compatibility testing. The donated plasma, in which antibodies are detected, could be used as in-house antiserum to reduce the hospital cost because commercial antibodies are very expensive.

P-355
PRE-TRANSFUSION CONSULTATION IN PATIENTS WITH POSITIVE DIRECT COOMBS TEST
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Background: Understand the patient’s immune history, especially those with direct Coombs test positive and with a recent history of blood transfusion. Through inquiry, we can quickly select effective test methods to detect and ensure the safety and timely treatment of blood transfusion.

Aims: Research methods and cross matching strategy for establishing blood samples of patients.

Methods: Serological methods: including saline medium, anti globulin, micro-column gel method, condensation method and absorption and dispersion test. The antibodies in red blood cell antigen and serum (plasma) were screened and identified. If necessary, the absorption of antibodies will be carried out for further identification. It is good for the accuracy of methodology.

Results: In 2016, 147 patients with refractory blood transfusion were examined. There were 43 cases of specific antibodies, 119 cases of positive anti - positive (14 cases with recent blood transfusion history). Direct Coombs test positive is the main cause of difficulty in blood distribution, accounting for 80.95%. Recent transfusions resulted in Direct Coombs test positive patients, with a prevalence of clinically significant immune antibodies up to 92.86%.

Summary/Conclusions: Detailed interrogation of blood before cross transfusion is essentially, because of the patient’s condition can be understood through interrogation, especially if there is a recent history of blood transfusion. If there is a recent transfusion and Direct Coombs test positive, then the possibility of immune antibodies produced by patients higher. In the test, select at least two or more methods for antibody screening, if necessary, further tests should be carried out to avoid the omission of weak antibodies, it can make transfusion safer and more effective.

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Abstract has been withdrawn

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ANALYSIS OF BLOOD IRREGULAR ANTIBODIES IN THE POPULATION OF CHINESE GUANGXI AREA
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Background: Blood transfusion is an important treatment to save patients’ lives. With the development of transfusion medicine, increasingly importance has been attached to safe transfusion. Studies have shown that irregular antibody is an important problem affecting the clinical safety of blood transfusion. Aim: To analyze the distribution characteristics of irregular antibodies in the patients of Chinese Guangxi Nanning area.

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Methods: 1206 patients with difficult blood cross matching were studied, all of them were from the hospitals of Guangxi Nanning area dated from January 2007 to December 2016, and showed positive by antibody screening test from the hospitals. The irregular antibodies were detected and identify by salt water method, polyhbre test and anti-globulin test.

Results: 516 patients were identified with irregular antibodies, the irregular anti-body positive rate was 42.79% (516/1206). Among the antibody positive patients, 245 were male and 271 were female, 302 had autoantibodies and 214 had alloantibodies. OF 214 patients with alloantibodies, 178 had a history of blood transfusion and/or pregnancy, 25 neither had history of blood transfusion nor history of pregnancy, 11 were hemolytic disease of newborn. RBC alloantibodies specificity: 10 were anti-D, 2 were anti-DC, 12 were anti-Ce, 2 were anti-C, 5 were anti-e, 64 were anti-E, 24 were anti-Ec, 6 were anti-e, 12 were anti-Mur, 1 was combination of anti-c and anti-Mur, 1 was combination of anti-E and anti-Mur, 2 were combination of anti-Ce and anti-Mur, 1 was combination of anti-C and anti-Mur, 1 was combination of anti-c and anti-Mur and anti-Jk?, 1 was combination of anti-Jka and anti-Jkb, 2 were combination of anti-E and anti-Jk?, 2 were combination of anti-Ec and anti-Jk?, 1 was combination of anti-Jka and anti-Jkb, 1 was combination of anti-c and anti-M; 25 were anti-M, 1 was anti-N, 2 were anti-Jk?, 2 were anti-Jka, 12 were anti-P, 9 were anti-Le?, 2 were anti-Le?, 2 were anti-CE-like, 4 were anti-Vpi-like, 1 was combination of anti-Whr and autoanti-body.

Summary/Conclusions: Most of the patients with irregular antibodies were female. The main irregular antibodies in Guangxi Nanning region were in Rh system [58.41%, 125/214] and MNS system [17.76%, 38/214]. There showed the highest compound irregular antibodies ratio of Rh system combination with MNS system, especially Rh system combination with anti-Mur antibody. We should be combined with a variety of detection methods to screen and identify the irregular antibodies, which is conducive to detection and identification of different antibodies, and help to provide timely and safe blood transfusion for patients.

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Abstract has been withdrawn

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A CURIOUS CASE OF SUSPECTED ANTI PP1Pk IN MAN WITH PROSTATE CARCINOMA

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Background: Anti PP1P (formerly known as anti-Tj?) has been documented to cause acute haemolytic transfusion reaction and spontaneous second-trimester abortion. This antibody is formed in the individuals with rare pp phenotype which lacks P, P1 and P? antigen. The frequency of this phenotype is approximately 5-6 in one million populations. In this case report, we describe a case of 60 years old Malay gentleman with history Prostatic Carcinoma, who was effectively planned for Robotic Prostatectomy. He needed 4 units of the crossmatched compatible blood prior to surgery. Due to inability to find the crossmatched compatible unit, the elective surgery needed to be postponed. The antibody which caused the incompatibility remains unknown due to technical limitations. Predeposit autologous blood donation was performed to collect blood for the patient prior to elective surgery.

Aims: To identify a complex case of irregular antibody to the high-incidence antigen.

Methods: Serological identification was performed on patient’s sample using (i) antibody panel identification (ii) papain treatment (iii) panel cells using standard procedures. A serologic red cells phenotype for C, c; E, e; K, k; Fy?, Fy?; Jk, Jk; M, N, S, s, Le?, Le?, P, and pp antigen were performed according to the manufacturer’s instructions. Known pp phenotype frozen packed cell and known Anti PP1P? serum was tested with the patient sample to confirm the findings.

Results: Patient blood group is Group O Rh (D) positive with negative P1 phenotype. Direct antihuman globulin test was negative. The antibody panel and papain treatment panel was pan reactive with negative auto-control result. Lysis was observed after immediate spin when tested with patient’s serum in the tube method.

Similarly, the reverse ABO grouping test gave comparable observations. Antigen typing analysis gave the following results: P1 Negative and Tj? Positive. Extended phenotyping analysis gave the following results: C/c (R1R1), K/k(b+), Fy(a-b+), Le(a-b+), MN, ss, and kk. When patient’s serum was crossmatched against with known pp phenotype frozen packed red cells, it was incompatible. Minor crossmatch between patient’s packed cell and known serum containing anti-PP1P? was incompatible too. Laboratory testing failed to prove the antibody specificity due to the limited resource. However, we cannot rule out the possibilities of having anti-P or anti-LKE antibody as well in this case.

Summary/Conclusions: Allimmunizations within the P system (anti-PP1P alloimmunization in patients belonging to the P group or anti-PP1 alloimmunization in patients belonging to the P? group) remain extremely rare and potentially serious conditions. Our results indicate that serology is not sufficient to identify the irregular antibodies and require further testing. In this case we have to perform predeposit autologous blood donation to prepare for his surgery and sample was sent to International Blood Group Reference Laboratory, Bristol for further investigation and we are still awaiting for the results.

P-360

DESCRIPTION OF ONE CASE OF DELAYED HAEMOLYTIC TRANSFUSION REACTION CAUSED BY THE “ENZYME-ONLY” ANTI-LITTLE E

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Background: The enzyme treated cells is not routinely used for the alloantibody screening and identification in the majority laboratories in China because the “enzyme-only” antibodies are considered as clinically irrelevance. The indirect antiglobulin test (IAT) is regarded as a sensitive and reliable method for detecting the significant alloantibodies, colloquially termed low-ionic strength saline (LIS-) indirect antiglobulin test (LIS) to detect the anti-LITTLE E, which is a low incidence antibody in China.

Aims: To report a case of DHTR caused by the “enzyme-only” anti-e.

Methods: A patient [female; 42 years of age with anaemia; blood group O, ccDEE] had been transfused a total of 16 units red blood cells in five times previously. After the last time of transfusion, the haemoglobin level increased. But 2 days later the transfusion, a symptom of chills, high fever (up to 40 degrees), nausea, vomiting and clinical signs of haemoglobinuria and haemoglobinuria were observed. And the haemoglobin level decreased, the haemacritorit decreased and the indirect biliru- bin level increased. Then, the antibody screening and identification records were retrospectively reviewed. The direct antiglobulin test (DAT) of the patient’s red cells and all blood samples before and after transfusion were tested again. The antibody screening was performed using a commercial panel of enzyme untreated 3-cell panel and an enzyme-pretreated (papain) 3-cell panel in the LIS/Coombs gel test. Subsequently, the antibody identification was carried out with an enzyme-pretreated (papain) 11-cell panel in the LIS/Coombs gel (DiaMed-ID, Cressier sur Morat, Switzerland) test. Subsequently, the antibody identification was carried out with an enzyme-pretreated (papain) 3-cell panel in the LIS /Coombs gel test (“enzyme-only” specific RBC alloantibody) were obtained. Allotanti-e was identified in the antibody identification testing. Titre of anti-e was 16. All samples from the donors before transfusion have a e antigen posi- tive. Due to the transfusion reaction, the antibody screening result of the serum only with the enzyme-pretreated (papain) 3-cell panel in the LIS/Coombs gel test (“enzyme-only” specific RBC alloantibody) were obtained. Allotanti-e was identified in the antibody identification testing. Titre of anti-e was 16. All samples from the donors before transfusion have a e antigen posi- tive blood group. Subsequently, 4 units of e-negative red cells were transfused to the patient. The haemoglobin level increased from 43 to 83 g/l, without an occur- rence of haemolytic transfusion reaction. In the next 12 months, the patient did not need to receive a blood transfusion.

Summary/Conclusions: “Enzyme-only” alloantibody can caused an acute and delayed haemolytic transfusion reaction. The routine use of the enzyme-treated red blood cells in the antibody screening and identification testing is very helpful for the identification of the specific RBC alloantibodies to ensure the transfusion safety.
P-361
IDENTIFICATION OF A CHINESE PATIENT WITH ANTI-JMH ALLOANTIBODIES
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Background: John Milton Hagen (JMH) blood group system (ISBT 026) includes five antigens expressed by the glycoprotein Semaphorin 7A encoded by the SEMA7A gene. Among them, JMH1 antigen is a high frequency antigen and JMH1-negative phenotype is extremely rare in all populations. The majority of JMH1-negative cases are of the acquired and transient phenotype often found in the elderly persons and have a chance to produce a likely autoanti-JMH that is not clinically significant, while the inherited JMH1-negative phenotype was only observed in one family without alloantibodies. Besides, several probands of JMH-variant phenotype with JMH1-like antibodies were reported resulting from the homozygous mutations of SEMA7A gene. In this study, a sample from one patient with a suspicious high frequency antibody was referred to the Reference laboratory for the antibody identification and blood crossmatching.

Aims: To clarify the specificity of the suspicious high frequency antibody in one Chinese patient.

Methods: Peripheral blood sample was collected from a 78 year-old gastric cancer patient. The routine antibody screening and identification were performed. Then, a soluble recombinant Sema 7A protein was used to determine the specificity of the antibody by the inhibition test in the indirect antiglobulin test with the gel technique. The direct antiglobulin test (DAT) and the self control were also performed with gel technique. Cross-matching test was performed using the RBCs of one of his daughters and two JMH negative cells. Fourteen exons of SEMA7A gene were amplified and sequenced in the patient and his daughter with available RBCs.

Results: The patient had a weak (2+) agglutination with all panel cells except self-control. The DAT test was negative. A negative crossmatching was only obtained with the two JMH negative cells and his daughter’s RBCs. The reaction of the serum with the JMH positive cells could be inhibited by the soluble recombinant Sema7A protein to indicate the presence of anti-JMH. The JMH antigen of the proband and his daughter was not determined for lacking the anti-JMH serum or monovalent antibody. The sequence results of the SEMA7A gene revealed two novel heterozygous variants located in the promoter region (-194G>C; p.Tyr169Tyr) in the patient and his daughter, while the same heterozygous variant (c.1989G>T) was also identified in one control sample.

Summary/Conclusions: The specific alloanti-JMH was firstly identified in a Chinese patient. Two novel variants (-194G>C; c.1989G>T) were identified in the proband and his daughter. Whether the two novel variants are the molecular basis for the unusual JMH1 expression is still needed further investigation.

P-362
A CASE REPORT OF RARE ANTI-TJA ANTIBODY
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Background: The P blood group system ranks the 4th after ABO, Rh and MNS. P system is considered to be a P phenotype, and the patient is cross-matched with the known P1-positive and P1-negative groups were hemolyzed. After hearing the patient serum to 56°C 30 min or the addition of ethylene diamine tetraacetic acid to serum, antigen antibody reaction is changed from hemolysis to agglutination, because of destruction of the complement fraction in the serum. The patient’s blood type is considered to be a b phenotype, and the patient is cross-matched with the known P blood donor, which was previously confirmed by the Shanghai blood center. The hospital successfully completed the operation after collecting 400 ml of the patient’s blood.

Summary/Conclusions: Through serological studies, the blood type of the patient was confirmed to be the rare P phenotype, and this antibody produced in her serum may led to her habitual abortions. With regard to the immunological factors, the anti-Tja antibody produced by the incompatible blood typing of the pregnant women and the fetal is an important cause of habitual abortion. For patients with such rare blood type, autologous blood transfusion is of great significance. Next, we will study the P phenotype of the patient and pedigree investigation through molecular biology.

P-363
ANTI-DIA, A CLINICALLY SIGNIFICANT RED CELL ALLOANTIBODY DETECTED IN PATIENT: A CASE STUDY IN A TERTIARY HOSPITAL
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Background: A 57 year old Indian gentleman with end stage renal failure presented at the Emergency Department with complaints of chills and non-vertigo giddiness. He has had previous Anti-E red cell alloantibody detected in 2015 and was trans-fused with approximately 38 units of Red Blood Cells compatible using the Electronic Crossmatch method over a 9-year period prior to Anti-E being detected. Current Group and Crossmatch sample typed the patient as O Positive with a positive antibody screen results on Cell 2 (donor number 318730), a R2R2 cell, (screening cells lot 8529292 from Ortho Clinical Diagnostics), yielding a strong 4+ reaction. Antibody exclusion panel yielded additional antibody(ies).

Aims: Presence of Anti-E and an additional clinically significant antibody(ies) was suspected. Specificity of the additional antibody(ies) needs to be determined in order to provide compatible blood products to the patient.

Methods: Based on our laboratory’s protocol, the positive antibody screen result with an R2R2 cell suggests the presence of Anti-E. An exclusion panel was designed and performed with Panocell-16 lot number 45,028 [Innucor Inc] using the Column Agglutination Technique (CAT, Ortho Clinical Diagnostics) to exclude all other clinically significant red cell alloantibodies. The red cells were diluted to 0.8% before the addition of patient’s plasma. The CAT cards were incubated for 15 min and centrifuged for 5 min prior to examination of reaction. Ten out of the 11 cells showed a negative reaction, which excludes all other clinically significant red cell alloantibodies. The one positive donor cell N4300 showed a strong positive reaction of 3+ despite being an rr phenotype cell. Further investigation was initiated to determine the presence of an additional antibody against a low incidence antigen.

Results: Donor 4300 was typed as Di [a]+ positive and this lead to investigating if the underlying newly produced red cell alloantibody was Anti-Di+. Two other cells (Donor N565 and H1687) from Panocell-16 lot 29,844 and 05,540 respectively, were selected and gave a strong 3+ reaction. Both cells were typed as Di [a]++. The investigations confirmed presence of Anti-Di+ in addition to the Anti-E.

Summary/Conclusions: Di+ antigen has a frequency of about 5% in Chinese (Reid, 2012) and 0.88% in Malaysean Indians (Cheong, Asian J Transfus Sci, 2013), which makes up about 70% and 10% respectively of the entire population of Singapore. This patient most likely has been exposed to the antigen during a transfusion episode. Antibody to Di+ is usually immunoglobulin G (IgG) but can also be immunoglobulin M (IgM) antibody. It is a clinically significant antibody and can cause hemolytic disease in the new born or hemolytic transfusion reaction. Obtaining compatible blood for this patient is not difficult and takes no challenge for subsequent transfusions in our Asian population since Di+ and E are both low incidence antigens. Unlike the E antigen, Di- negative units cannot be antigen typed as...
commercial Anti-D<sup>+</sup>-reagent is not available in our institution. Hence, E negative, antiglobulin crossmatch compatible units are recommended for patient’s subsequent transfusions. Inclusion of D<sup>+</sup>-antigen in the antibody screening cells is not mandated currently by our local authorities and the need may have to be ascertained. Patient’s retrospective records were reviewed and no signs of delayed transfusion reaction were observed. Patient was well and discharged from hospital uneventfully 2 days after Anti-D<sup>-</sup> was detected.

P-364
AUTOIMMUNE HEMOLYTIC ANEMIA – CLINICAL AND IMMUNOHEMATOLOGICAL PROFILE: EXPERIENCE FROM A TERTIARY CARE HOSPITAL IN NORTH INDIA
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Background: Autoimmune hemolytic anemia (AIHA) is characterized by increased red cell destruction and/or decreased red cell survival due to autoantibodies directed against self-antigens on red cells. AIHA is classified as warm AIHA, cold AIHA and mixed AIHA. Positive ‘direct antiglobulin test’ (DAT) remains the diagnostic hallmark in addition to laboratory evidence of hemolysis.

Aims: This study is an attempt to critically analyze the clinical and immunohematological profile and serological characterization of red cell bound autoantibodies.

Methods: The prospective study was conducted at Regional Blood Transfusion Center, Lady Hardinge Medical College (LHMC) & Associated Hospitals over the period of 4 years (2011-14) in 32 patients with clinical diagnosis of antibody under evaluation. DAT done using gel technology (Bio-Rad, Switzerland) was positive in all the patients.

Results: Autoimmune hemolytic anemia (AIHA) was diagnosed in 26 patients. Autoantibodies were identified in 23 cases, out of which 20 cases with IgG only, 2 cases with IgM only and 1 case with IgA only. 19 cases showed IgG and IgM and 2 cases showed IgM and IgA. 1 case had both IgM and IgA.

Summary/Conclusions: The study highlights the importance of performing DAT and IAT in all cases of unexplained hemolysis. DAT negative cases were ruled out by identifying the types of antibody and complement. The clinical parameters were analyzed among different antibody types, DAT (+) and DAT (-) AIHA.

P-365
CLINICAL CHARACTERIZATION OF DIRECT ANTIGLOBULIN TEST OF AUTOIMMUNE HEMOLYTIC ANEMIA: A STUDY OF 44 CASES
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Background: The direct antiglobulin test (DAT) is a laboratory test that detects immunoglobulin and/or complement on the surface of red blood cells. There is no systematic and comprehensive clinical analysis of immunoglobulin and complement of autoimmune hemolytic anemia (AIHA) so far.

Aims: To investigated the clinical characteristics of immunoglobulin and complement on the surface of red blood cells of AIHA.

Methods: DAT test was performed on 44 patients with AIHA, and the positive samples were further identified the types of antibody and complement. The clinical parameters were analyzed among different antibody types, DAT (+) and DAT (-) AIHA.

Results: Twenty six cases were DAT positive, while 18 cases were DAT negative.

The hemoglobin concentration (Hb), red blood cell (RBC) count and hematocrit in 26 DAT positive AIHA patients were significantly lower than those in 18 DAT negative patients (P < 0.01). While the mean corpuscular volume (MCV), the mean corpuscular hemoglobin (MCH) in DAT positive AIHA group were significantly higher than those in DAT negative group (P < 0.05), the mean corpuscular hemoglobin concentration (MCHC) in DAT positive AIHA group were significantly lower than those in DAT negative group (P < 0.05).

Among the DAT positive patients, the type of IgG/C3d was the highest, accounting for 6 cases, followed by IgG/IgM/C3d/C4d in 4 cases, IgM/C3d/C4d in 2 cases, IgG/IgM/C3d/C4d/C3bl/1q in 2 cases. The Hb and HCT in multiple antibody with more than two antibodies and IgG/C3d were both significantly lower compared to IgG group (P < 0.05). While the MCH in Multiple antibody were obviously higher compared to IgG/Cd group (P < 0.05), the MCHC in Multiple antibody increased obviously than the IgG group (P < 0.05).

Summary/Conclusions: The DAT shows a variety of antibody types in AIHA. The severity of anemia and hemolysis of DAT positive AIHA patients is more severe than those of DAT negative patients. There is a certain relationship between the degree of hemolysis and the intensity of immunoglobulin.
Background: A total of 3 Kidd blood group antigen are Jka, Jkb, Jk3, they are the most common ones. They are encoded by the blood group gene of the long arm of chromosome 9 and almost never to be weakened, and the pathological blood type may mutate.

Methods: To investigate the Jk(a-b-) phenotype in blood donors in Northeast China.

Results: A total of 3 Kidd blood group antigen are Jka, Jkb, Jk3, they are the urea transporter proteins. There are four different phenotypes in the Kidd blood group system: Jka (a+b), Jkb (a+b), Jka (a-b), Jkb (a-b). The Jka (a-b) phenotype erythrocyte is lack of the urea transporter proteins, it cannot concentrate urine as much as possible. The Jka (a-b) phenotype is rare in most populations and there are significant differences in frequency in different regions.

Aims: To investigate the Jk (a-b) phenotype in blood donors in Northeast China.

Methods: 2M urea and suspended red blood cells (2mM) were added to 3:1 by the method of test tube for screening of unhemolytic samples. To identify the serotypes used the monoclonal antibodies which against Jka and anti Jkb antibodies of IgM. Genotype was determined by PCR-SSP.

Results: Allo-anti K: 4 out of 97 patients (4.1%).
Allo-anti C: 4 out of 97 patients (4.1%).
Allo-anti D: 2 out of 97 patients (2.1%).
Allo-anti Jk: 4 out of 97 patients (4.1%).
Allo-anti S: 2 out of 97 patients (2.1%).

Summary/Conclusions: The frequency of Jka (a-b-) phenotype in blood donors in Harbin was significantly lower than that in other regions reported in China. It is an effective measure which establish the Jka (a-b-) phenotype donors in this region, to solve the blood transfusion problem in patients with this type of blood group.

P-368
ASSOCIATION BETWEEN CD4 CELL COUNT AND BLOOD GROUP ANTIGENS DISTRIBUTION IN HIV INFECTION
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Background: CD4 cell count has been a major predictor of disease progression and monitoring of the effectiveness of highly active antiretroviral therapy (HAART) in HIV infection along with the HIV-1 RNA level. Blood group antigens have been reported to be associated with many diseases conditions severely. Studies have suggested that ABO blood groups have an impact on infection status of the individuals possessing a particular blood group due to the significant associations observed when analyzed. However there is limited information on the relationship between these blood group antigens with CD4 cell count and haemoglobin genotype in HIV infection, hence the need for this study.

Aims: To determine the association between CD4 Cell Count, Blood Group Antigens and Haemoglobin Electrophoretic Pattern in HIV infection.

Methods: Exactly 360 subjects who are ≥16 years, consisting 240 newly enrolled seropositive patients and 120 apparently healthy blood donors were recruited for this study. Antibodies to HIV were determined using rapid HIV 1/2 test kit (Abbott), enzyme linked immunosorbent assay (ELISA) (GenScreen plus HIV Ag-Ab test kit, Paris) and Western blot (New-LAV Blot 1, Bio-Rad, France) for confirmatory test. ABO and RhEusus blood grouping was determined by standard tile and tube techniques using anti-A, Anti-B and anti-D reagents (RAPID Labs Ltd, UK). Hae-moglobin genotype determined by alkaline cellulose acetate haemoglobin electrophoresis while CD4 cell count was estimated with Partec Cyflow analyser.

Results: The mean ± SD CD4 cell count obtained for both the patient and control group is 472.44 ± 14.48 (cells/mm³) and 571.17 ± 314.26 (cells/mm³) respectively. Of the 240 patients, 132(55%), 54(22.4%), 45(18.8%) and 9(3.8%) are ABO blood groups O, A, B and AB respectively while 204(85%) and 36(15%) are Rhesus Positive and Negative respectively. The patients group had 198(82.5%) with CD4 count ≥200 cells/mm³; 42(17.5%) had CD4 count ≤200 cells/mm³ while all participants in the control group had CD4 count ≥200 cells/mm³. A significant association was observed between the CD4 cell count of the patients and their ABO blood group antigens (P = 0.04) and their haemoglobin genotype (P = 0.01) with blood group A followed by blood group AB and HBAA having the highest CD4 count.

Summary/Conclusions: This study reiterates the fact that blood group antigens are involved in immune protection against infectious disease. Blood group A which has been implicated to confer susceptibility in some diseased condition has also been observed to confer immunity through its association with CD4 cells in this study. Therefore further study is required to understand the mechanism by which CD4 cell count is increased in blood groups A and AB in HIV infected individuals.

P-370
THE VARIATION OF BLOOD TYPE IN ACUTE MYELOID LEUKEMIA PATIENTS
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Background: Blood type is a hereditary trait in the human body which controlled by the blood group gene of the long arm of chromosome 9 and almost never change. But in some cases like leukemia (which is reported to be an acute myeloid leukemia, M2a), tumor, multiple myeloma and so on, the ABO blood group is likely to be weakened, and the pathological blood type may mutate.

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Aims: To explore the variation of blood type in MzA patients and discuss the blood transfusion methods and precautions in those patients with clinical blood type variation.

Methods: Statistical analysis the number of 893 patients with MzA who were hospi-
talized between January 2012 and June 2017, the ABO and RhD blood type, and the blood type and their changes before and after chemotherapy treatment. Finally, the genotypic of blood group was identified in patients whose blood type changes. The antibody titer of serum blood group was determined after the blood type variation, and every chemotherapy cycle was tested one time.

Results: In statistical of acute myeloid leukemia patients, two cases have ABO blood serum type variation, respectively: 0 to B, B to AB, female, aged 19 and 23, and blood type changes are in IA chemotherapy for the 6 week. Finally, the blood type were mutated blood type identified by the genotypy.

Summary/Conclusions: The change of the antigen is the main reason of blood type variation. The antigen recovery after chemotherapy in the two MzA patients, and then blood type mutates, so blood type of such patients should be monitored closely during chemotherapy, and research on the reasons affected the antigens, which might be used on clinical application, and finally reduce blood type errors causing blood transfusion reactions.

P-371
THE STUDY ON CORRELATION BETWEEN HIV INFECTION AND DUFFY BLOOD GROUP POLYMORPHISM IN NANJING AREA POPULATION
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Background: Duffy blood group was one of the cytokine receptors on red blood cell membrane, and as the HIV virus co-receptor involved in viral infection. The major polymorphisms of the Duffy blood group system: Fya and Fyb have only one amino acid difference (Asp42Gly). Whether Duffy polymorphism involved in HIV infection remains unclear.

Aims: To investigate the relationship between HIV infection and Duffy blood group polymorphism in Nanjing area population.

Methods: Peripheral EDTA blood samples were collected from HIV positive individ-
uals, and Duffy serological phenotype were performed with commercial anti-Fya and anti-Fyb reagents. The genomic DNA was extracted and Duffy genotyping were performed by PCR-SSP. The genotyping results were compared with the frequencies of Duffy gene in the normal population which have been reported before.

Results: 334 cases with HIV positive infection were collected. Among those, 301 were Fy(a+b-)[H0.120%], 32 Fy(a+b)[9.581%], 1 Fy(a-b)[0.299%], and no Fy(a-b) were found. Genotyping results were consistent with the serological results, and the gene frequency of FYA and FYB were 0.949 and 0.051, respectively. In the prelimi-
nary report, FYA and FYB gene frequencies were 0.9538 and 0.0462 in the normal population. Two groups of Duffy blood group typing showed no significant differ-
ce (P = 0.573, <0.05).

Summary/Conclusions: Duffy blood type has not significantly difference between HIV positive infection and normal population, and the association between Duffy polymorphism and HIV infection remains to be further studied.

P-372
PREVALENCE OF RED CELL BLOOD GROUP ANTIGENS AMONG EGYPTIAN POPULATION AND OTHER POPULATIONS
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Background: Blood group antigens are macromolecules on the outer surface of the red blood cell, some of these antigens may be found on the surface of the tissues as they are not red cell specific. They may be either proteins or glycolipids but mostly glycoproteins e.g. the ABO system specificity is determined by the oligosaccharide sequence, while the MN, kell, Duffy, Kidd and Diego system specificities are deter-
mined by the amino acid sequence.

Aims: The Knowledge of prevalence of different blood group antigens in any popu-
lation helps to manage cases of allo-immunization especially multi-transfused patients. Those patients who suffer from thalassemia, sickle cell anemia, cancer, etc. are most likely to develop antibodies against minor blood group antigens, thus antigen negative blood is required for those patients who are already allo-immu-
nized and sometimes with more than one antibody. Finding compatible units for such patients without having any knowledge of the prevalence of complicated anti-
gens in any population is hard time consuming process.

Methods: A total number of 1200 regular blood donors in NBTC (national blood transfusion center) were subjected to RH system phenotyping ([D, C, E, c, e]. The donation included both sexes with 4/1 male to female ratio (total number of males = 933; total number of females = 267) age ranging from 18 to 45 years. The classical method used for testing the blood group antigens was column agglutination technique using grifols neutral capsules and mono specific anti-sera. This method is simple, specific, accurate and has a very high sensitivity. A 3 ml fresh non hemol-
ized EDTA blood sample was used for preparation of 5% RBCs suspension to detect RBC antigen. 10 microns of red cell suspension is added to 25 microns of mono specific anti-sera. Positive test results in case of red cell agglutination and negative test results in case of no agglutination of RBCs.

Results: Prevalence of phenotypes associated with blood group antigens over the last 5 years (2013 till 2017) was found to be:

Among Egyptians: R1r=33% (no. of patients=396) / R1R1=17% (no. of patients=204) 
/r=14% (no. of patients=168) / R0R0=12% (no. of patients=144) / R2R2=8% (no. of patients=96) / R2r=7% (no. of patients=84) / R2R1=1% (no. of patients=12).

Among Asians: R1r=8.5% / R1R1=52.8% / R0R0=10.1% / R0r=8.3% / R2R2=1.4% / R2R1=2.5%.

Among Blacks: R1r=21% / R1R1=28% / R2R2=6.8% / R0R0=46% / R0r=2.2% / R2R1=18.5%

Summary/Conclusions: The distribution of different blood group antigens in Egypt and other populations has a clinical significance in blood transfusion medicine and in hemolytic diseases. It is important in providing antigen negative blood to patients with medical conditions, who often require regular blood transfusion and thus sav-
ing a lot of lives through serving much more patients in less time.

P-373
EXISTENCE OF GIANT PANDA ERYTHROCYTE BLOOD GROUP ANTIGEN
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Background: Allogeneic and xenogeneic blood transfusions with blood of Giant Panda and Asiatic black bear were proved to be very effective in previous cases, while the blood type which is the key point that determines the safety of blood transfusion has not been found.

Aims: In this study, allogeneic and xenogeneic cross matching tests were made to reveal the blood types of Giant Panda and Asiatic black bear.

Methods: Allogeneic agglutination phenomena among Giant Panda(11) and Asiatic black bear(10) blood samples were observed in cross matching tests, then the reason of agglutination phenomena were analyzed by using human and mice blood.

Results: Three serological patterns(n = 1; n = 4; n = 35) were found in Asiatic black bear tests, while weak agglutination was observed in Giant Panda tests. Agglu-
tination patterns among the plasma of different Asiatic black bears and RBC of Giant Panda(11) were not regular, RBC of mice agglutinated with all of the plasma of Giant Panda and Asiatic black bear and the same phenomena were observed among the plasma of human with RBC of Giant Panda and among RBC of human with the plasma of Giant Panda. However, agglutination was not observed among the plasma of mice with RBC of Giant Panda.

Summary/Conclusions: First, there were at least three blood group antigens in Asiat-
ic black bear species; second, agglutination phenomena in the allogeneic and xenogeneic cross matching tests of Giant Panda and Asiatic black bear were caused by blood group antibodies rather than interspecific antibodies. All above indicated that there were blood group antigens in Giant Panda.
P-375

THE ESTABLISHMENT OF A RARE BLOOD DONOR BASE
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Background: It is difficult for patients with rare blood type of blood supply, in order to ensure the safety of clinical blood of patients with rare blood type, along with the advance of medical level, almost all in some developed countries set up a rare blood type blood donor database. In 2008, a number of blood centers in China jointly launched the China rare blood type database project, which carried out the screening and researching work of rare blood type. The establishment of blood protection system of rare blood type can provide scientific basis for clinical practice, timely obtain effective information, and win valuable time for emergency transfusion of patients.

Aims: To establish a rare blood type protection system in northeast of china. Minimize the risk of blood for rare blood patients.

Methods: 1. With RBC blood group serology and PCR method, the genetic testing for our province ABO, RSD, MNs, Duffy, Kell, Dombrock, Diego, Kidd, Scianoa, Colton, Lutheran, V1 14 RBC blood group system such as 36 antigen for screening.

2. Selection the samples of Harbin unpaid blood donors are screened for the rare blood group Jk(a-b-) of the Kidd blood group system. 3. The rare antibodies obtained in my laboratory were screened, and the serum of the clinical patients was screened for the Ii system rare antigen and Fya- antigens.

Results: 1. The rare blood type that will be screened, with computer and network platform form as the carrier, combined with modern blood stations management, the establishment of a rare blood type in Heilongjiang province security system, including database and the physical library. 2. The screened rare blood types such as a-Jk(a-b-) for frozen storage, -80 degrees has a 10 year period. To reply the urgent need of clinical blood, reduce the adverse reaction of blood transfusion and improve the curative effect.

Summary/Conclusions: The establishment of the north China rare blood type library, can be in clinical emergency blood use in patients with.

P-376

INVESTIGATION ON THE DISTRIBUTION OF ABO, KELL AND P BLOOD GROUP ANTIGEN OF THE BLOOD DONORS IN LIUZHOU AREA
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Background: Landsteiner has first found the human red blood cell ABO blood group system since 1901, so far there has been found 36 red blood cell blood group systems confirmed by ISBT, including Kell and P blood group systems. As a genetic marker of human, red blood cell blood group has great significance in the fields of blood transfusion medicine, immunogenetics and forensic medicine. The distribution of ABO, Kell and P blood group systems exists difference among different race, nationality and region. Many scholars in China have studied the distribution of ABO, Kell and P blood group of the blood donors in Liuzhou area. The distribution of ABO, Kell and P blood group of the blood donors in Liuzhou area has not been reported. In order to investigate the distribution of ABO, Kell and P blood group antigen of the blood donors in Liuzhou area, we conducted this research.

Aims: To investigate the distribution of ABO, Kell and P blood group antigen of the blood donors in Liuzhou area.

Methods: Using research method of blood group population genetics, 1680 blood donors were enrolled into the investigation random in Liuzhou area, and the distribution of ABO, Kell and P blood group antigen and their gene frequency were analyzed.

Results: The distribution of ABO blood group: 0:0.429 2:0.283 3:0.388; the distribution of gene frequency: A (0.434 2.00) A- (0.566 2.00). The distribution of Kell blood group: All were K-k, K-k+ and K-k could not be detected; the distribution of gene frequency: k was 1.000, K was 0.0000. The distribution of P blood group: P (0.117 2):P (0.882 3):P (0.152 3).

Summary/Conclusions: The distribution of ABO, Kell and P blood group antigen of the blood donors in Liuzhou area accords with the distributive characteristic of blood group antigen of southern Chinese population.

P-377

IMMUNODEFICIENCY MAY CAUSE ABO BLOOD GROUPING DISCREPANCY
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Background: ABO blood grouping discrepancy is frequently seen in clinical patients due to different causes. Immunodeficiency is one of the causes. A 24 years old young man with arthritis of the left shoulder who was going to have an operation, was found ABO blood grouping discrepancy, whose direct ABO blood group is O and reverse ABO blood group is AB. He had recurrent bacterial infections, such as pneumonia, arthritis, sinusitis since he was a little boy.

Aims: To study the cause of ABO blood grouping discrepancy of the young man who has immunodeficiency.

Methods: The amount of immunoglobulin isotypes (IgG, IgM, IgA, IgE) were detected and CD19+B cells were grouped by flow cytometry in the laboratory.

Results: All of Ig isotypes are extremely low and the count of CD19+B cells in the peripheral blood is significantly decreased. X-linked agammaglobulinemia(XLA) is suspected and confirmation test will be done by sequencing the BTK(Baratin's tyrosine kinase) to identify the exact mutation.

Summary/Conclusions: Immunodeficiency such as XLA may cause ABO blood grouping discrepancy due to the unexpected deficiency of the IgM anti-A and anti-B reciprocal antibodies.

P-378

SEROLOGICAL AND GENE DETECTION OF B (A) BLOOD GROUP IN 3 CASES
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Background: B (A) blood type was first discovered in 1985, and its formation mechanism is that B allele occurs single base mutation on the basis of normal B gene sequence. The variant B gene has the ability to encode bifunctional active enzymes, which in turn exhibit a small A antigen specificity in addition to B antigen specificity.

Aims: To identify the exact mutation.

Methods: AB serological-typing was tested using tube method and geno-typing was detected using DNA sequencing in 3 cases.

Results: 1 blood donors with positive A and B serology results, anti A1c with weak agglutination, the reaction of red blood cells and anti H antibodies were significantly enhanced, no agglutination reaction with anti A1 antibody, it is found by sequencing of exon seven B allele mutation in 640A>G, the AB0 genotype was B (A) 04-001; 2 blood donors with positive AB serology results, anti A1c with weak agglutination, the reaction of red blood cells and anti H antibodies were significantly enhanced, no agglutination reaction with anti A1 antibody, it is found by sequencing of exon six B allele mutation in 700C>G, the AB0 genotype was B (A) 07-001.

Summary/Conclusions: Identification of subtypes or rare blood type analysis in serological combined with molecular biological methods. Timely and accurate identification of ABO blood group and subtype, to ensure the safety of blood transfusion.
RESOLVING ABO DISCREPANCIES: AN ANALYSIS OF 53 CASES
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Background: It is difficult to report the results of blood types when there are ABO discrepancies which can be affected by patient age, diagnosis, previous pregnancy, transfusion history, treatments, heredity etc.

Aims: The aim of this study is to resolve ABO discrepancies, analyze the reasons accordingly, and to provide proper blood products when needed.

Methods: Based on the three step analysis for ABO discrepancies, 53 cases of discrepant blood samples from January 2014 to December 2016, were identified by a series of serological tests. Retrospective analysis of patients was recorded and the results were categorized into four types of reactions respectively.

Results: Red blood cell autoantibodies accounted for 29 (54.7%) cases of ABO discrepancies, and precipitated extra reactions in both forward and reverse type or in the reverse type only; Unexpected allisoantibodies and plasma protein abnormalities involved 11 (20.8%) cases of extra reactions in the reverse type, whereas weak antibodies led to 8 (15.1%) cases of weak reactions in the reverse type. In addition, weak ABO antigens, Para Bombay and AB subgroup caused 50 (9.4%) cases of weak or missing reactions in the forward type.

Summary/Conclusions: In this study, the major cause of ABO discrepancies was found to be red blood cell autoantibodies and the three step analysis helps to resolve ABO discrepancies. Blood type identification contributes to the selection of appropriate blood, which is essential to a safe and effective clinical blood transfusion process.

ANALYSIS OF DISCREPANT ABO RESULTS IN BLOOD DONORS IN HEGANG
W Shang and Y Liu
Central Blood Station of Hegang City, Hegang City, China

Background: In the past nearly 2 years, hegang blood station has encountered positive and negative stereotypes in the usual work, conducted further analysis and identification, and summarized the results of the report

Aims: To analyze the situation of the positive and negative typing of blood donors in practical work, and exclude the unqualified blood. Then classify the persons who are not fit to give regular blood donation again.

Methods: Using serological methods to determine ABO blood type, in case of positive and negative types inconsistent, for positive definite form increase setting anti - AB, anti - A1, anti - H detection, for reverse typing use conventional stereotypes with AB, anti - A, anti - H. For blood group antigen weakened is 1 cases, blood group antibody weakened is 2 cases, 1 case of cold autoantibody, and rouleaux are 4 cases.

Summary/Conclusions: The conclusion of this investigation to identify ABO blood group with blood donors accounted for the proportion is 0.11%, 20 cases of positive and negative antibodies do not fit in, cold autoantibody accounted for 10%, accounting for 40% of irregular antibodies, antigen antibody decreased 5%, decrease accounted for 10%, accounted for 5% of abnormal plasma protein, ABO subtype accounted for 10%. Rouleaux agglutination accounted for 20%, to avoid the waste of blood, the abnormal coagulation and false rouleaux condensation blood caused by the plasma protein was normally given out to use in the case of that the blood does not affect the normal distribution. With irregular antibody, high titer cold autoantibody blood can be prepared into washed red blood cells release clinical, finally will be marked in the donor's personal file, suggesting that when the blood donors ask for donating blood again, we should pay more attention, and we propose the blood donors should not donate routine blood again.

DEL PHENOTYPE DETECTION AND ANALYSIS FROM RHD NEGATIVE BLOOD DONORS IN NANCHANG AREA
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Transfusion Laboratory, Nanchang Blood Station, Nanchang, China

Background: DEL blood transfusion may cause anti-D antibodies in RhD negative recipients.

Aims: To study DEL phenotype distribution and RhD gene from RhD negative blood donors in Nanchang area.

Methods: Detected RhCE phenotypes of RhD negative blood donors confirmed by indirect anti-human globulin test and DEL phenotype samples contain RhD gene.

Results: Among 84 RhD negative donors, 42 for cce (50.6%), 29 for Cce (34.9%), 11 for CcEe (13.1%), 1 for CcEe (1.2%) and 1 for ccEe (1.2%). DEL(26.2%) were found in 84 RhD negative blood donors, 15 for Cce (18.2%) and 7 for CcEe (8.2%) in Jinan, similar to the results of other areas in China but quite different from which of Caucasian and Japanese.

COMPARISON OF RHD BLOOD GROUP TEST AMONG THE TUBE INDIRECT ANTIGLOBULIN TEST, MICRO-COLUMN GEL METHOD AND THE GLASS BEAD METHOD
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Background: In the Rh blood group system, the antigenicity of D antigen was strongest. The expression of RhD antigen could be classified into D+, D- and D variant. Of D antigen, a decrease in number and variation in the structure caused D-variant. D variant could stimulate RhD negative blood donors to produce antibodies, prone to immunohemolytic transfusion reaction, as was D antigen. According to the regulation of AABB, it was necessary to conduct a confirmatory test for the apparently RhD negative blood donors. At present, there were the classic
Determination of weak “D” antigen among Rhesus negative Pakistani blood donors

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Background: Until the 19th century the blood transfusion procedure was unsafe, but this mystery was solved in 20th century with the discovery of ABO and Rh blood group antigens. The discovery of Rh system in 1939 was great to break through in transfusion medicine. It is the most significant blood group system after ABO. There is significant proportion of patients who’s RBCs lack “D” antigen makes anti-D, if they have exposed to the “D” antigen by blood transfusion. Therefore, determination of Rhesus (Rh) phenotype is of critical importance. It causes hemolytic transfusion reactions and hemolytic disease of newborn.

Aims: Determination of weak “D” antigen, to highlight the importance of “Du Testing” among the Rhesus-negative blood donors.

Methods: This Cross-sectional Study was conducted at department of Hematology, Allama Iqbal Medical College, Lahore. Five different tertiary care and four secondary care hospitals of Lahore and six different institutes/universities including individuals visiting to blood banks for determination of their blood groups were included in study. Two ml of blood sample was collected in EDTA-containing vial and analyzed for determination of ABO/Rhesus (Rh) typing; all Rh-negative samples were further processed for the Du Testing according to standard protocol and commercially available monoclonal antibody.

Results: Out of total 55,874 participants only 8.0% (n = 4,454) were Rh-negative. Among these Rh-negative samples, 99.0% (n = 4,410) samples were negative even after “Du Testing”, Only 0.98% (n = 44) were weak “D” positive, in Rh-negative samples.

Summary/Conclusions: Every Rh-negative individual should be processed for the detection of Weak “D” antigen by “Du Testing” as it may not be detected by immediate spin tube method.
Aims: China, with ethnic minorities accounting for 15.44 percent of the city's permanent types in different populations varied. Kunming is the capital of Yunnan province in the most important, and group genetic studies showed that the frequency of Rh phenotype frequency among the Yi ethnic group.

Results: From a total of 391 randomly phenotyped donors, data revealed that 214 (54.73%) were R1R1, 116 (29.68%) were R1R2, 27 (6.90%) were R1r, 20 (5.11%) were R2R2, 11 (2.81%) were R2R1, and 6 (1.53%) were R2r. The results were similar to the results of the National Blood Center, Thai Red Cross Society, mouse monochlonal antibody of Japan, foreign companies. In the area of stability, it was stable over a 12 month period.

Summary/Conclusions: According to the properties studied, it indicated that the specific phenotype of monoclonal anti-H reagent clone SA9 2E2 was better or equivalent to anti-H from many sources including the reagents of the National Blood Center, Thai Red Cross Society. It can be diluted 4 times lower, leading to low production costs. Moreover, it was stable potency in accordance with the requirements of reagents. Therefore, it is appropriate to substitute the anti-H from a lectin.

Aims: To replace the complex method of producing anti-H produced from Ulex europaeus seeds including the inequal potency of Antibody in each production lot.

Methods: The supernatant clone SA9 2E2 was tested and mixed with 4% BSA diluted to 1: 4 for monoclonal anti-H reagents. Potency [Titre] and stability of antibody were investigated in comparison with the supernatant of Japan (murine monoclonal antibody) and anti-H of foreign companies as well as the supernatant produced from a lectin from Ulex europaeus of the National Blood Center, Thai Red Cross Society.

Results: It was found that the antibody potency of monoclonal anti-H reagent was 1:64. The net score was 67. The antibody potency of monoclonal anti-H reagent was greater than one produced from a lectin and a lectin of foreign companies. However, the potency was less than the potency of mouse monoclonal antibody of Japan. In the area of specificity, H Antigen of ABO and Parabomyx can be verified. It was found that the weak or strong reaction depends on a amount of H substance in each blood type: O > A2 > A2B > B > A1 > A1B.

Summary/Conclusions: According to the properties studied, it indicated that the specific phenotype of monoclonal anti-H reagent clone SA9 2E2 was better or equivalent to anti-H from many sources including the reagents of the National Blood Center, Thai Red Cross Society. It can be diluted 4 times lower, leading to low production costs. Moreover, it was stable potency in accordance with the requirements of reagents. Therefore, it is appropriate to substitute the anti-H from a lectin.
was 0.000, indicating the ratio of plasma and reagent RBCs was a major influencing factor. Taking both results from direct-viewing analysis and variance analysis into consideration, 0 rpm was selected as the optimal incubation speed and the proportion 90:30 was selected as the optimal ratio for plasma and reagent RBCs. To minimize the cost of antibody reagents, 30 μl:30 μl was selected as loading amount for forward typing. Under optimal conditions obtained from orthogonal design, a set of 322 random donor samples were carried out to confirm the optimized combination, no erroneous results were found.

Summary/Conclusions: Optimization of a new system is a prerequisite to most analytical systems in immunohematology laboratories. The orthogonal design was successfully applied for determining the optimal parameter combination of the Microlab STAR BG analytical system and to guide the optimizing operation. It may also be applicable to other automated blood typing analyzers and other optimization problems in immunohematology laboratory.

P-394
INVALID RESULTS ANALYSIS OF FULL-AUTOMATIC BLOOD TYPING INSTRUMENT
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Background: With the rapid development of blood stations, the automation and standardization of full-automatic blood type instrument can meet the needs of large numbers of samples. However, invalid results are often observed in the tests, so the cause analysis and solutions are very important for the safety of clinical blood transfusion.

Aims: To investigate the accuracy of full-automatic blood typing instrument in the identification of blood types, and analyze the causes of invalid results in our tests and then formulate appropriate strategies.

Methods: From August 2016 to June 2017, 210055 blood samples were submitted to ABO and Rh (D) identification by GALILEO NEO full-automatic blood typing instrument. The samples of invalid results were rechecked by the tube method and the reasons were analyzed. Additionally, ABO blood typing discrepancies and Rh (D) negative samples were sent to blood typing laboratory for confirmation.

Results: Out of 210,055 blood samples, 208,785 (99.4%) were correctly identified, and 1270 (0.6%) were invalid. There were 78 samples with ABO blood typing discrepancies, and among them, cold antibody, specific antibody, weak antigen and weak antibody were 5 (0.4%), 19 (1.5%), 20 (1.6%) and 34 (2.7%), respectively. 223 (17.5%) cases were near the critical value. In the remaining 969 cases, there were 376 (29.6%) with non-added samples, 325 (25.6%) with negative control results, 90 (7.1%) lipemic samples, 154 cases with pollution (12.1%), and 24 (1.9%) without reagents.

Summary/Conclusions: There were higher detection efficiency and accuracy of GALILEO NEO full-automatic blood typing instrument for large numbers of samples, and it was also convenient for manual check and trace. But we should pay attention to invalid results in our tests, and reexamined these results by the tube method. Manual check and technical training should be strengthened and blood donors should be consulted carefully before donation. Additionally, the daily maintenance and calibration of instrument can greatly reduce the invalid results.

P-396
A COMPARISON OF CONVENTIONAL TUBE TECHNIQUE WITH ORTHO-VISION AUTOMATED TESTING PLATFORM FOR ABO ANTIBODY TITRATION- A PILOT STUDY
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Background: Significant variation in titer reporting between different laboratories has been reported previously. Performing ABO antibody titers is critical for determining both, the effectiveness of pre-transplant regimes and when titer are low enough to permit transplant.

Aims: To compare the ABO antibody titer results obtained by the automated testing (Ortho Vision) with conventional tube technique.

Methods: Isoagglutinin titers were tested in parallel by two different technologists in 91 patients (36-A, 54-B and 1-O blood group) using the conventional tube technique.

Results: The IgM and IgG antibody titers by CTT were in perfect agreement with Ortho Vision in 20.8% and 32.9% of the cases respectively, IgG and IgM antibody titers by Ortho Vision were higher than those by CTT in 75.8% and 56% and lower than in 3.2% and 11.7% cases respectively. However, the difference between the results reported by the two techniques was not statistically significant (P > 0.05).

Summary/Conclusions: The automated platform Ortho Vision yielded comparable results with the gold standard method. We plan to study further the repeatability and variation of the titers with reference to patients blood groups and the type of transplantation, ie solid organ and hematopoietic stem cell transplantation.
P-398 EVALUATION OF ORTHO VISION MAX® ANALYSER® MAX ANALYSER– RESULTS OF FIELD APPLICATION TRIALS AT SIRIRAJ HOSPITAL, THAILAND

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Sriraj Hospital, Bangkok, Thailand

Background: In 2006, Laboratory implemented fully automated immunohematology instruments, to improved laboratory operational efficiencies, safety checks and increased testing capabilities. Currently, AutoVue® Innovva analysers are used for routine and specialized immunohematological testing in laboratory. In 2015, a new ORTHO VISION MAX® ANALYSER is a recent addition to the list of fully automated immunohematology instruments available in Laboratory. Field Application Trials of the ORTHO VISION MAX® ANALYSER were undertaken by these laboratories as an opportunity to use the analyser prior to their respective set-
tings and to provide feedback on the general ease of use and system efficiency of the analyser.

Aims: The ORTHO VISION MAX® is a new instrument designed to fully automate in vitro immunohematological testing of human blood using the ORTHO BioVue® System column agglutination test (CAT). Field Application Trials was conducted to evaluate the performance of the new instrument compared to the ORTHO AutoVue® Innovva [AVI] System.

Methods: Field Application Trials of the ORTHO VISION MAX®, ANALYSER was conducted in the Department of Transfusion Medicine, Faculty of Medicine, Siriraj Hospital, Thailand between 26 May, 2016 – 5 July, 2016. Two or more staff mem-
bers completed on-line and extensive key operator training on the ORTHO VISION MAX® ANALYSER prior to commencement.

The Field Application Trial involved the completion of a series of structured test activities/cases using the ORTHO VISION MAX®, ANALYSER and completion of the associated questionnaire for each case, per site. Test activities/cases were undertaken to evaluate:

- System Training.
- System Configuration.
- Quality Control (QC).
- Maintenance, Start-up and Shutdown.
- System Efficiency.
- Serial Dilution.

Results: Key findings from the Field Application Trials of the ORTHO VISION® analy-
syer were:

- System training was easy and intuitive, leaving Key Operators confident to on-
train other staff members.
- System configuration was easy to navigate and setup was largely intuitive.
- Quality Control menu was a vast improvement over the current system, but could be further expanded to provide additional functionality.
- Maintenance is easy to perform, and support documents provided are detailed enough to be useful.
- Efficiency of the ORTHO VISION® Max is greatly improved over the ORTHO AutoVue® Innovva.
- Automating Serial Dilutions studies allows these time consuming and largely manual tests to be automated and standardized in an easy to use format.

Summary/Conclusions: Department of Transfusion Medicine, Faculty of Medicine, Sriraj Hospital, Thailand found the ORTHO VISION MAX® analysers to be efficient, easy to operate and provide significantly improved functionality and testing throughput compared to current ORTHO AutoVue® Innovva analysers.

P-399 EVALUATION OF THREE MICROCOLUMN AGGLUTINATION TECHNIQUE AUTOMATIONS FOR RED CELLS ALLOANTIBODIES DETECTION IN THAI BLOOD DONORS

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Background: Microcolumn agglutination technique automation was developed for pretransfusion tests to replace conventional tube test. This method is reported that it has the same sensitivity as conventional tube test for antibody screening test. Recently, microcolumn agglutination technique automation platforms have become widely used for red cell antibody detection in hospital blood bank in Thailand.

Methods: In this study, we evaluated three microcolumn agglutination technique automated platforms (ORTHO VISION® Max; Ortho Clinical Diagnostics Pencoed,UK, Erytra; Grifols, Barcelona, Spain and IH-1000;Diamed GmbH, Cressier FR, Switzerland) for red cell alloantibodies detection compared with conventional tube test (Indirect Antiglobulin Test:IAT) using two cell screening (Thai Red Cross Society). One hundred and twenty known positive samples and 2,014 random samples were tested in parallel by tube test and three automated platforms. From 120 known positive samples, antibodies consisted of Anti-Mi® [64], Anti-E [15], Anti-P [10], Anti-Le a+ [7], Anti-D [5], Anti-m (4), Anti-Mi®+ Anti-E [4], Anti-S [3], Anti-T [2], Anti-Le [1], Anti-Di® [1], Anti-Jk® [1], Anti-Iy® [1], Anti-P [1], Anti-Le [1], Anti-E-Anti-M [1]. Results: The performance of three automated platforms for detection of known positive samples was similar to random routine samples. In known positive samples, 89.91% were detected by ORTHO VISION® Max, 111/120 (92.59%) by Erytra and 97/120 (80.83%) by IH-1000. All 120 positive samples reacted in conventional tube test. From a total of 2,014 random samples, 60 samples reported positive results and 1,954 samples reported negative results by conventional tube test. The sixty red positive cell alloantibodies consisted of Anti-P [21], Anti-Le a+b [15], Anti-
M [7], Anti-Le [6], Anti-Le a+b [5], Anti-Mi® [5] and Anti-E [1] by conventional tube test. Fifty-five samples (9.16%) showed positive results by ORTHO VISION® Max, 20/60 (33.33%) by Erytra and 10/50 (16.67%) by IH-1000. From 1,954 negative sam-
ple, there are 3, 2 and 1 samples that showed false positive results by ORTHO VISION® Max, Erytra and IH-1000 respectively.

Summary/Conclusions: The sensitivity of all three microcolumn agglutination technique automated platforms for the detection of red cell alloantibodies in Thai blood donors was highest in ORTHO VISION® Max. However, the samples tested in this study were Thai blood donors using in-house screening cells from the National Blood Centre, Thai Red Cross Society. The microcolumn agglutination technique automation is appropriate for red cell alloantibody detection in a routine laboratory blood transfusion service.

P-400 EVALUATION OF THREE KINDS OF RED CELL PANELS FOR IRREGULAR ANTIBODY IDENTIFICATION

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Background: Irregular antibody screening is one of the important measures to ensure the safety of clinical blood transfusion. The various performance and efficacy charac-
teristics of panel cells that can identify irregular antibodies must be tested.

Aims: To compare the differences and characteristics of the three commercially panel cells and to discuss the current status of irregular antibody identification.

Methods: According to the principle of irregular antibodies identification the charac-
teristics of domestic and imported panel cells were evaluated.

Results: The appearance, hemolysis rate, antigen specificity, aseptic test and other aspects of the three panel cells were all in line with regulatory requirements. The domestic panel cells contained 10 groups of red cells and there were 25 blood type antigens in 10 blood type systems. One of the imported panel cells contained 11 groups of red cells and there were 26 blood type antigens in 9 blood type systems. Another imported panel cells contained 16 groups of red cells and there were 28 blood type antigens in 9 blood type systems. The domestic panel cells could detect most of the meaningful antibodies and some rare antibodies effectively, such as: Rh, MN, Lewis and other blood type system; Otherwise, the imported panel cells were better than those of domestic cells in the aspects of blood system, the number of

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blood type antigens and the level of antibody identification. The following antigens were the most obvious: C, c, K, k, s, Leh, Fya, Fyb, Jka. Imported panel cells were more scientific in terms of dose-effect arrangements than domestic cells and had an advantage in antibody identification.

Summary/Conclusions: The principle of irregular antibody identification is to use the smallest serum/panel cells to identify most of the meaningful common antibodies and some rare antibodies. Scientific and rational use of antibody identification panel cells can effectively prevent immune transfusion reactions and reduce the risk of neonatal hemolytic disease.

P-401

Abstract has been withdrawn

P-402

ANTIBODY SCREENING OF BLOOD DONORS
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Background: Since December 2016, Blood Transfusion Unit of Bekasi County has done antibody screening to all sample of blood donor. Antibody screening is an examination to find if there is any unexpected antibody in donor serum. We do antibody screening with magnetized method using Qwalsys 3. The purpose of antibody screening is to select the blood donor sample which contain unexpected antibody, so the blood donors which will be transfused is safer and the transfusion reaction that caused by the reaction of antigen & antibody will be avoided.

Aims: To evaluate the result of antibody screening in 7 months.


Results:

<table>
<thead>
<tr>
<th>Months</th>
<th>Donor amount</th>
<th>Amount of positive antibody screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>December</td>
<td>4,814</td>
<td>3</td>
</tr>
<tr>
<td>January</td>
<td>3,949</td>
<td>1</td>
</tr>
<tr>
<td>February</td>
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<td>2</td>
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<tr>
<td>March</td>
<td>5,294</td>
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</tr>
<tr>
<td>April</td>
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</tr>
<tr>
<td>May</td>
<td>6,149</td>
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</tr>
<tr>
<td>June</td>
<td>2,271</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>32,271</td>
<td>16</td>
</tr>
</tbody>
</table>

Summary/Conclusions: Based on the result of antibody screening in 7 months, from total 32,271 of blood donor sample, there were 16 positive results. The percentage of positive result of antibody screening is 0.049%. Since we found positive result for antibody screening, we suggest to do further examination to the samples which have positive result and antibody screening has to be done to all of blood donor samples.

P-403

STUDY ON THE STRATEGIES FOR DOUBTFUL ABO BLOOD GROUP
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Background: ABO blood typing in pre-transfusion testing is a major component of the high workload in blood banks that therefore requires automation. We often experienced discrepant results from an automated system, especially weak serum reactions. We evaluated the discrepant results by the methods of traditional test tube typing, absorption-elution and ABO genotyping to confirm ABO blood typing.

Aims: To analyze the results of doubtful ABO blood grouping, and investigate the strategies for doubtful ABO blood grouping for ensuring safety of clinical blood transfusion, traditional test tube typing, absorption-elution and ABO genotyping to confirm ABO blood typing.

Methods: 712 samples of blood donors from Liaoning Blood Centre were typed by automatic blood analyzer from the year 2010 to 2016. The methods of traditional test tube typing, absorption-elution and ABO genotyping were used to detect the samples for ABO groups.

Results: 717 (97.95%)cases of ABO group were confirmed by test tube typing, 457 cases (62.43%) with weak anti- B, 171 cases (23.36%) with weak anti - A. Irregular antibodies were found in 115 cases (15.71%), 18 (2.45%) cases with anti-M, 1 (0.14%)case with anti- E and 1 (0.14%) case with anti-Le (b) being identified. 15 cases of ABO subgroups were confirmed by ABO genotyping, 1 (0.14%)case with AB01, 1 (0.14%)case with A~1B, 1 (0.14%) case with A~1 M, 1 (0.14%) case with A~1 N, 1 (0.14%) case with A~1P, 1 (0.14%) case with A~1Q, 1 (0.14%)case with para-Bombay A type and 1 (0.14%)case with antigen A-weakly expressed ABO004 being confirmed.

Summary/Conclusions: The main reasons responsible for doubtful ABO blood groups by automatic blood analyzer were weak anti-B, anti-A and irregular antibodies. In Chinese in Shenyang region, subgroup B is more common than subgroup A. The samples of doubtful ABO blood groups by automatic blood analyzer should be analyzed by both traditional test tube typing and ABO genotyping.

P-404

ANALYSIS OF ABNORMALITIES IN ABO BLOOD TYING OF CHANGSHA BLOOD DONORS
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Background: ABO blood antigen is the highest immunogenicity in human blood system antigens, and it is the key to ensure the safety of clinical transfusion. ABO subtypes, impaired blood antigens, irregular antibodies and human errors or technical reasons can lead to abnormalities of ABO blood typing. We did a retrospective statistical analysis of the abnormalities in ABO blood typing from laboratory medicine of Changsha Blood Center, and analyzed blood products returned by hospitals due to ABO blood typing abnormalities.

Aims: To analyze the abnormalities in ABO blood typing of Changsha blood donors, such as subtypes or missing detection of special antibody, ABO typing discrepancy, etc. We are aimed to explore the causes and laboratory treatment measures of the abnormalities, and to know about the blood scrap.

Methods: Microplate colormetric method was used to screen the blood types of donors, and we use hand-holding tube method to examine the irregular blood types, such as irregular antibody identification, so as to judge whether the blood were available in clinical infusion.

Results: In Changsha blood center, there were 148 abnormalities in ABO blood typing of 562,293 blood donors from 2013.1.1 to 2017.1.31. There were 58 special antibodies in plasma, 26 with low antibody value, 24 subtypes, 5 false condensation and 35 with other causes. In total, 54 blood products were sent back by hospital because of blood type qualities. There were 34 special antibodies in plasma, 13 with cross-matching incompatibility, 4 subtypes, 3 wrong blood types.

Summary/Conclusions: The common reasons of abnormalities in ABO blood typing are nonspecific aggregation, subtypes and special antibodies. We should strengthen the training of laboratory to keep from abnormal test, and ensure blood safety.

Red Cell Immunology: Molecular

P-405

Abstract has been withdrawn
MOLECULAR BASIS OF THE B(A) PHENOTYPE AND ITS CLINICAL TRANSFUSION ANALYSIS

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Background: Numerous examples of A or B subgroup alleles have been described in many geographical and ethnic groups. Among them, the B(A) blood group is extremely rare. It is due to the inheritance of a single chromosome encoding an enzyme with both A and B transferase activity. Here, we describe a rare variant based on a nucleotide substitution c. 700G>C (p. P234A) in the B glycosyltransferase gene, identified in a patient with aberrant ABO phenotypes.

Aims: To investigate the serological characteristics and molecular characteristics of the B(A) phenotype, and to review safety issues in relation with clinical transfusion.

Methods: The individual was confirmed by standard serological techniques. The genotyping and sequencing were performed using polymerase chain reaction-sequence specific primer (PCR-SSP), direct sequencing and gene clones for Exon6 and exon7 of ABO locus respectively. A survey was carried out to investigate what is the actual position that the proband was used in the clinical transfusion.

Results: Both A and B antigens were detected on red blood cells of the proband and there was anti-A antibody in the serum. The result of PCR-SSP was B/O02 phenotype. The direct DNA sequencing and gene clones revealed that the gene was B[AI] 02/002. The B[AI]02 allele had one nucleotide change(c.700G>C) at position 700 compared with that of B101 allele, which resulted in an amino acid substitution (P234A). The results of cross match testing is in accordant between the proband and two donors with phenotype A/B and there was no clinical adverse reaction after transfusion.

Summary/Conclusions: 700G>C of B allele can result in B(A) phenotype in the individual with the phenotype of A2B. The donors in the transfusion for the individual with B(A) phenotype should include individuals with A,B phenotype.

MOLECULAR ANALYSIS OF FUT-1,2 IN CHINESE POPULATIONS FROM SOUTHEASTERN AND NORTHERN REGIONS OF CHINA WITH THE PARA-BOMBAY BLOOD TYPE

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Background: The incidence of the para-Bombay blood type in Chinese populations from the Southeast of China was estimated as 0.8%, and only one case has been reported out of a population of one million Chinese individuals in Northern China. Laboratory testing for para-Bombay generally perform anti-H and absorption-elution tests on peripheral venous blood and saliva samples. However, in some clinical conditions, such as a coma state or when it not clear whether the patient is conscious, it is very difficult to obtain a saliva sample.

Aims: The aim of this study was to evaluate the consistency between serotyping and molecular analysis in Chinese individuals with para-Bombay blood type. To observe differences in molecular features between Chinese individuals with para-Bombay blood from the Southeast and North of China, we conducted a molecular analysis of gene fragments from FUT-1, FUT-2, FUT-3, and ABO exon 6, 7 on each para-Bombay blood sample.

Methods: Molecular analysis of gene fragments from FUT-1, FUT-2, FUT-3, and ABO exon 6, 7 was used in conjunction with serotyping, including a saliva test and an absorption-elution test to examine A, B, and H substances and antigens, and further routine testing for ABO, H, and Lewis phenotypes.

Results: All eleven anti-H negative samples from Southeast China were identified as para-Bombay, by sequencing of FUT-1 and FUT-2. Of these, five samples were homozygous 547-548delAG, three samples were heterozygous 880TT deletion, and three samples were heterozygous 547-548delAG combined with the heterozygous 880TT deletion. In contrast to para-Bombay samples from Northern China, these samples were heterozygous 5986C>T, heterozygous 3268G>A and 6490T>C, combined with the heterozygous 880TT deletion. The sequencing of FUT-2 confirmed 357C>T in fourteen samples, demonstrating that H, A, and B substances were secreted in the saliva, except in two samples which were reported as 385A>T (H29F) heterozygous, which is a weak secretor, and all samples from Northern China were 385A>T. The saliva test for A, B, and H substances, and the absorption-elution test examining the A, B, and H antigens on the surface of red blood cells completely matched the ABO exon 6, 7 sequencing results.

Summary/Conclusions: The incidence and mutation types of para-Bombay from various areas of China showed diversity, especially in para-Bombay samples from North of China, which comprised various mutation types. The sequencing of FUT-1, FUT-2, and ABO exon 6, 7 may become a useful tool to confirm the para-Bombay blood type.

CAUSE ANALYSIS AND IDENTIFICATION OF B (A) SUBTYPE MISSED DETECTION

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Background: PK7300 automatic are widely used in blood type testing. Limited to the methodology and the diversity of B(A) type serological characteristics, B(A) type are often undetected by PK7300 automatic. So we need to identified this blood type and analyze the missed reasons.

Aims: The missed B (A) blood group was analyzed and identified by serological and molecular biological characteristics, in order to find the missed reasons for PK7300 automatic.

Methods: The ABO blood group was detected by the method of blood group serology, the ABO blood group genotype was detected by PCR-SSP method, the coding region of exon 6 to exon 7 in ABO gene was amplified by polymerase chain reaction(PCR) and the PCR products were sequenced. The haplotypes were analyzed by cloning and sequencing.


Summary/Conclusions: Due to methodological limitations and serological characteristic of B (A) subtypes, ABO subtype are often undetected by PK7300 automatic method.

STUDY ON A-1,3-N-ACETYLGALACTOSEAMINOTRANSFERSASE GENE 389 T > C VARIANT

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Background: The gene locus for the ABO blood group system encodes a glycosyltransferase. Weak expression of A/B histo-blood group antigens is often explained by single nucleotide substitutions at the ABO locus. We investigated the basis of weak A phenotype in a individual.

Aims: To study the effect of A antigen expression for 389 T > C variant of the α-1,3-N-acetylgalactosaminotransferase gene of ABO gene by the ABO alleles’ molecular genetic analysis in a individual was suspected as rare Ax subtype of ABO variant.

Methods: Serological assays were performed to identify ABO blood group on the samples of the proband. The extracted DNA was genotyped by sequence specific primer polymerase chain reaction (PCR-SSP) followed by directly sequencing for exon6 and exon7 of ABO locus to identify the ABO gene haplotype of the proband. The bioinformatics analysis was carried out by biological analysis software to investigate the change of structure and function of enzymes influenced by the change amino acid.

Results: Weak A antigen was detected on red blood cells of the proband and there was anti-A and anti-B antibody in the serum. DNA sequencing showed 261delG and 389 T/C heterozygote from exon6 to exon7. By haplotype sequence analysis, two alleles Ax22 and 001 were obtained. The sequence of Ax22 allele had a nucleotides...
change (T to G) at position 389 compared with that of A101 allele resulting in an amino acid substitution [L130P]. The 389 T-C mutation can disrupt the space conformation of its protein product, affecting the function of the protein.

Summary/Conclusions: T-C at n389 of a-1.3-N-acetylgalactosaminyltransferase gene can result in the great reduction of A antigen activity. We can conclude that the amino acid 130 locates activity region of the enzyme encoded by ABO gene.

P-412
A NOVEL A ALLELE WITH C.538C>T MUTATION IDENTIFIED IN A3 PHENOTYPE
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Background: A3 is characterized by mixed-field reaction with a few large agglutinates among large amounts of free cells when typing with anti-A. The underlying mechanisms of A3 phenotype were diversified.

Aims: To perform serologic and genetic analysis to investigate the molecular mechanism of ABO serologic discrepancy detected in one A3 phenotype patient referred to our laboratory.

Methods: ABO serologic tests were done by the standard serologic protocol. Genomic DNA was isolated from the blood by a commercial kit according to the manufacturer's instructions. The ABO gene upstream CBF/NF-Y enhancer region, promoter, ABO -5.8-kb site, exons and adjacent introns were amplified and sequenced. PCR products of exon 6 to exon 7 and adjacent introns of the ABO gene were cloned and the DNA sequences were analyzed.

Results: The A antigen of red blood cells (RBCs) demonstrated mixed-field agglutination when tested with routine ABO blood group typing. The proband carried heterozygous missense mutations C-T at the position 467 and 538 in the ABO gene causing a substitution of Pro to Leu at position 156 [p.P156L] and Arg to Cys at position 180 [p.R180C], respectively which expressed A3 phenotype. No other mutations were found in the promoter, CBF/NF-Y enhancer region, other coding regions or the exon-intron boundaries of the ABO gene. Cloning sequencing confirmed that the novel C.538C>T single nucleotide polymorphism was associated with the A102 allele.

Summary/Conclusions: Our study suggested that the C-T substitution at position 538 of the ABO gene could decrease expression A antigen on RBCs causing the generation of the A3 phenotype. Correctly identify these subgroups to improve the accuracy of blood typing is important for compatible transfusion.

P-414
SEROLOGY AND MOLECULAR STUDY ON RARE AW AND BW BLOOD GROUP
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Background: Identifying genetic variants of the ABO gene can reveal new molecular mechanisms of the ABO blood group. Either A3 or B3 is a very rare ABO blood group phenotype and the genetic mechanism underlying it still remains largely unknown. Here we report the molecular genetic analysis of 83 unrelated ABO subgroup individuals from Qingdao and its surrounding areas.

Aims: To determine the genotypes of the blood samples whose serological results seem like A3 or B3, through DNA sequencing analysis.

Methods: Serologic investigations including serum transferase activity assay were performed with standard methods. The blood samples were preliminary genotyped by PCR-SSP. Complete Exon 6 and Exon 7 in the ABO genes were amplified by PCR and the PCR products were analyzed through direct DNA sequencing or sequencing after gene cloning to identify its genotype.

Results: The serological results of these blood samples were similar: red cells were weakly agglutinated by anti-A or anti-B. In the 83 rare ABO alleles, we identified 14 A305 (467C>T, 767T>C), two A1.11 (940A>G), 49 Bw03 (721C>T), eight Bw07 (1055G>A), eight Bw02 (905A>G), one Bw17 (784G>A), and a novel A26 (278G>T, 467C>T) subgroup allele. All of these were point-mutation alleles and the mutation sites were detected in Exon 6 and 7 which resulted in the amino acid changes.

Summary/Conclusions: Through sequencing analysis, the haplotypes of the 83 samples typed as A3 or B3 in serological tests are identified. Amino acid substitutions resulted from point-mutations on ABO gene change highly conserved regions of the enzyme and may reduce the activity of the glycosyltransferases, leading to the A3 or B3 phenotype.

P-415
MOLECULAR MECHANISM RESEARCH OF A3 OR B3 BLOOD SUBTYPES IN SHANDONG PROVINCE
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Background: Molecular mechanism of A3 or B3 blood subtypes is not clear. And the research results of different regions are quite different.

Aims: Analysis the molecular mechanism of serological suspected A3 or B3 blood subtypes in Shandong Province from 2014 Jan. to 2017 Jun.

Methods: Serological tests were performed to characterize erythrocyte phenotype of all samples that we collected from Shandong Province. Polymerase chain reaction (PCR) direct sequence ABO gene enhancer (-3988 bp to -3645 bp), promoter (-149 bp to -2 bp), exon 1-7 and flanking sequence, and GATA binding site in intron (~-5.7 kb) of suspected samples. For the samples with a mutation, haplotype sequencing is used to confirm again.

Results: By serological test, we suspected 38 samples of A3 or B3 subtype, which accounting for 10.1% of subtype samples in the same period. By DNA sequencing, we identified 7 samples of A306, 1 samples of A304, 2 samples of Bw07, 2 samples of Bw03, 1 sample of Bw16, and 1 sample of Bw17. And 3 samples were confirmed as chimeric by Short Tandem Repeats (STR). Bw03, which more frequently in Taiwan area, and mutation in enhancer or promoter area reported in Japan were not detected in our samples.

Summary/Conclusions: Compared with other areas, molecular mechanism of A3 blood subtypes in Shandong Province changed litter, while B3 subtype varied greatly. The difference was obvious with Taiwan or Japan, while close to domestic cities such as Shanghai and Hangzhou.
ANALYSIS ON SHANDONG PENINSULA POPULATION OF ABO GLYCOSYLTRANSFERASE WITH DUAL SPECIFICITY

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Background: To investigate the molecular genetic basis CisAB and B(A) subgroup of ABO blood group system in Shandong Peninsula population, China.

Aims: To elucidate a molecular genetic and genealogical analysis of members of an novel Ax family in Shandong Peninsula, China.

Methods: One Ax phenotypes were identified in a Shandong Peninsula Chinese W. The 745 C T substitution in the gene of the A307 subtype. In order to ensure the safety of blood transfusion, the genotyping should be carried out when necessary.
P-422
THREE CASES OF BW BLOOD GROUP SEROLOGY AND GENOTYPE ANALYSIS
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Background: Although ABO subtype is rare, it may seriously affect the safety and efficacy of blood transfusion. ABO subtype is one of the major causes of the positive and negative qualitative changes of ABO blood group. The correct identification of the ABO blood group is the first step in safe blood transfusion.
Aims: To identify 3 cases of BW blood group with serology and genetic experiments.
Methods: Monoclonal antibody - A, B, D, H antibody and antireagent red blood cells were used to determine blood typing by serological method. Molecular biology pcr-ssp method was used to sequence the exons of ABO gene 6 and 7.
Results: In the three cases, the anti-B was weak, and the opposite A cell concentrated agglutination, and B cell was weakly concentrated. The samples of the three cases were found to have B antigen on the surface of red blood cells by assimilate and diffuse experiments. 721C>T base mutation in exon seventh of B gene was found in a samples by sequencing, and 278C>T mutations in 2 cases.
Summary/Conclusions: Blood type and molecular biology experiment were combined to determine 1 case of Bw111, 2 blood type Bw1210. Recommended infusion O type red blood cells and type AB plasma.

P-423
A CASE OF B SUBGROUP IDENTIFICATION AND FAMILY INVESTIGATION
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Background: ABO subgroup often lead to incorrect blood type identification. It may cause blood transfusion incident. In recent years, blood type detection is more accurate with the molecular biology techniques used. This makes clinical blood transfusion safer and more effective.
Aims: Identify blood type of blood donors exactly to ensure the blood supplied to clinic is correct.
Methods: ABO blood-type was detected by serological test. Neutralization test was used to detect blood group substances. Genotyping was performed by PCR-SSP. Gene mutation was detected by gene sequencing. Family investigation was carried out for her parents and brother.
Results: Absorption-elution test detected B antigen. Neutralization test detected B, H substances. PCR-SSP confirmed genotyping O1B. Sequencing results showed nt695 site Ti/C missense mutation occurred compared with Bw41 sequence. This mutation was named Bw41. Family survey showed her father also carried Bw111 allele.
Summary/Conclusions: The blood type of blood donor was Bw111 subtypes.

P-424
Abstract has been withdrawn

P-425
STABLE EXPRESSION OF HUMAN RH D PROTEIN ON THE MEMBRANE OF MOUSE T33 FIBROBLAST CELLS
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Background: Administration of polyclonal anti-D immunoglobulin is used to prevent Rhd alloimmunization in pregnant women. Currently, the polyclonal anti-D is produced from the plasma of volunteer donors. The efforts to replace polyclonal anti-D with monoclonal anti-D have been severely hindered by the fact that the mechanism of action of anti-D has not been fully elucidated. The elucidation of the mechanism has in turn been hampered by lacking of suitable experimental models. The model most physiologically comparable to the human situation would be a transgenic male mouse with human RhD expression on mouse erythrocytes to mate with a wild type female mouse to produce a hemolytic disease of the fetus and newborn disease model. To generate a successful transgenic model, it is crucial to understand how surface RhD expression is achieved.
Aims: To express human RhD protein on the membrane of mouse cells lines using lentiviral transduction.
Methods: The cDNA coding sequences of human RHD (hRHD) and human RHAG (hRHAG) were cloned into pLEFfG and pSINK lentiviral vector, respectively. In addition, a hybrid construct of RHD in which the human C-terminus was exchanged for the mouse sequence, was cloned. Mouse T33 fibroblasts, 1/11 erythroblasts and erythroleukemia MEL cell line were simultaneously transduced with hRHD and hRHAG constructs. By CRISPR/CAS9 approach the mouse RHAG (mRHAG) and mouse Rifc (mRfc) genes were disrupted in the 1/11 cells (either both or each gene separately), KO-cells were subcloned and loss of expression was verified by RT-PCR. After 72 h in culture, surface expression of hRHD and hRHAG was analyzed using human polyclonal anti-D serum, a panel of anti-D monoclonal antibodies (MoAbs) including Bric69 and Ptx241 and mouse MoAbs anti-RhAG (clone 2D10 and LA18.18) respectively, by flow cytometry. 1/11 cells were also tested after induction of terminal erythroid differentiation (van den Akker, 2010).
Results: In all mouse cell-lines strong expression of hRHD protein was accomplished. However, surface expression of hRHAG protein disappeared in 12 days after transduction in 1/11 erythroblast and erythroleukemia MEL cells, while it could be stably expressed on the membrane of T33 fibroblast cells. As expected, hRHD protein could not be expressed in the absence of hRHAG protein. hRHD protein could be stably expressed on the membrane of T33 fibroblast cells, but in contrast no surface expression of hRHAG protein was detected on 1/11 erythroblasts and erythroleukemia MEL-cells when the hRHD and hRHAG constructs were co-transduced in these cells, also not in the cells lacking endogenous expression of mRfc and/or mRhAG, neither in terminal differentiated 1/11 cells. Because for the expression of hRHD the interaction of its C-Terminus with ankyrin is essential and mouse erythroid cells express different ankyrins, we tested whether the expression of hRHD could be obtained by replacing the human C-terminus with the mouse sequence. But again no RhD expression was seen in any of the 1/11 cells.
Summary/Conclusions: Whereas for the expression of human RhD in mouse fibroblast cells the cotransduction of human RhAG is sufficient, no RhD expression was observed in mouse erythroid cells could be obtained. We demonstrated that this is not due to the expression of RhD protein or mRhAG, or lack of interaction with mouse erythroid ankyrin. We hypothesized that in the mouse erythroid cells either a co-factor needed for expression is missing or an inhibitor of expression is present. The present study offers us the tools to investigate this mechanism, and has direct implications for the construction of a transgenic RhD mouse.

P-426
MOLECULAR GENETIC ANALYSIS OF 779A-G AND 1227 G-A MUTATIONS OF RHD GENE RESPONSIBLE FOR A WEAK D
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Background: Rh blood group system is the most complex and immunogenetic blood group system. Prevalent RhD alleles varied in different populations. Here, a study was investigated with weak or discordant D serologic typing by the molecular level in Chinese persons.
Aims: To analyze the molecular genetic basis of RhD alleles of an individual with rare weak D phenotype.
Methods: The regular serological methods and indirect antiglobulin test (IAT) were performed to characterize the RhD blood group. Mutations of the RHD gene were screened by polymerase chain reaction, reverse transcription polymerase chain reaction (RT-PCR) and DNA sequencing. The cDNA amplified product was TA cloned and haplotype analysis. The mutations were analyzed using Polyphzen2, SIFT, HSF, DMANAM 4.0 and Swiss-PolhView4.1.0 software.
Results: The Rh D blood group of the proband was detected as weak D. The result of PCR amplification showed that all of 10 RhD gene exons were presence. 779 A/G and 1227 A/G heterozygote were detected by gDNA and cDNA sequencing. After TA cloning and haplotypes sequencing analysis, two alleles weak D 779G and DEL were obtained. The sequence of weak D 779G had one nucleotide change (A to G) at position 779 in exon5 compared with that of RhD allele resulting in an amino acid substitution (H260R). The sequence of weak D 1227G had one nucleotide change (G to A) at position 1227 in exon7 compared with that of RhD allele resulting in no amino acid substitution. Both mutations can disrupt the space conformation of its protein product, affecting the function of the RhD protein.
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Vox Sanguinis © 2017 International Society of Blood Transfusion
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Background: The Rh blood group system is the most polymorphic system of the red blood cells (RBCs), consisting of 54 blood group antigens. Next to the ABO system, it is most clinically significant in transfusion medicine. Besides the common D or –D phenotype, a plethora of D variants also exist, which were commonly classified into weak D, partial D, and DEL phenotypes. In this study, the RHD genotype was analyzed in the Chinese donors with D variant phenotype and one novel RHD variant allele was identified.

Aims: To investigate the variant RHD alleles in the Chinese population.

Methods: The blood samples with D variant phenotype were collected from the Guangzhou Blood Center and Blood Center of Shanxi province in China. The RHD and RHCE genes were analyzed by the developed Multiplex Ligation-dependent Probe Amplification (MLPA) genotyping assay. Further sequencing of ten exons of the RHD gene was conducted in the donor having a RHD variant allele that could not be defined by the MLPA analysis. The serological typing for D antigen was conducted by using the two monoclonal anti-D reagents [Clone Rum-1 and TH-28 (MS-26) and the commercial panel anti-D reagents (D-Screen, Diagast)].

Results: One donor collected from the Blood Center of Shanxi province with a novel RHD variant allele defined by a missense mutation (c.688A>C, p.Ser230Arg) was identified by sequencing of RHD gene. RHD*688C/RHD*01N.01 (D deletion) and ccvEe genotypes were determined by the MLPA analysis combined with sequencing. RBCs of this donor negatively reacted with the monoclonal IgM anti-D (Clone Rum-1 for epD6.1, while weakly reacted with IgM/IgG anti-D((1 – 9) –D and (1 – 9) –D in 1 case (0.67%), RHDG in 1 case (0.33%), RHDA/G in 1 case (0.33%), RHD10137C in 1 case (0.33%), RHD 1227A/G in 1 case (0.33%), and in 1 case (0.29%), no mutations in all 10 RHD exons were found. There are 6 alleles and genotypes in 24 cases of D variants respectively, RHD45 G/A in 15 cases (62.50%), RHD845G6/A; 1227 G/A in 1 case (4.17%), RHD 71161C; 1227 G/A in 1 case (4.17%), RHD 71161C; 1227 G/A in 2 cases (8.33%), G in 2 cases (8.33%). In addition, we found 1 RHD negative and 2 D variant novel alleles.

Summary/Conclusions: There are rich genetic polymorphisms in RhD negative blood donors in Qingdao area, absence of the whole RHD genes is main.

P-431

POLYMORPHISM OF RH D MRNA SPliceosome IN CHINESE POPULATION

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Background: Rl of different genetic background between different races of human beings, so the races and the regions’ expression of RhD gene and the formation of antigen are different. RhD antigens are attributed to the RHD genes corresponding to the chomosome RHD gene in humans (1p34-p36), including RHD and RHCE gene. The relative orientation of RHCE gene relative to RHD gene and RCE genes. The relative orientation of RHCE gene (5′–3′) to RHD gene (5′–3′) that similarity of up to 96%, which are composed of 10 exons. The RHD and RHCE two genes of high similarity, so often have different expression in different individuals in Chinese population. This results may provide a basis for the further studies of genetics of RHD system and the cross-state RHD blood group gives the expression of RhD antigens.

Aims: To explore the molecular basis for an individual with a rare weak D phenotype.

Methods: We selected 150 cases of RhD positive blood samples in Chinese randomly and extracted mRNA in whole blood and reverse transcribed into cDNA. The cDNA as template that analysed the RHD mRNA spliceosome polymorphism between individuals. Results: The 150 cases of RhD positive blood samples that the full-length RHD mRNA spliceosome for 100% (150/150), the RHD gene with deletion of exon-7 accounted for 85.3% (128/150), the deletion of exon-7,8,9 accounted for 96.0% (144/150), the deletion of exon-7,9 accounted for 0.7% (1/150), the deletion of exon-8,9 accounted for 8.7% (13/150), the deletion of exon-9 accounted for 8.7% (13/150), the deletion of exon-10 accounted for 2.7% (4/150), the deletion of exon-10 accounted for 4.0% (6/150). But not found the deletion of exon-8 and the exon-7 spliceosome in Chinese population.

Summary/Conclusions: The polymorphism of RhD mRNA spliceosome among different individuals in Chinese population. This results may provide a basis for the study of human RhD blood group genes and the expression of RhD antigens.
A weak D 960A has been detected. A 960G mutation and DNA sequencing.

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Vox Sanguinis genotype of RHD alleles was determined as RHD*1227A allele was positive, corresponding with the dCCee phenotype which

Results: A total of 13 kinds of genotypes with an allele described before, RHD*1227A/DVI.3 (n = 1), RHD*1227D/DVI.3 (n = 1), RHD*weak D type 15/01N.01 (n = 4), RHD*960A/D01N.01 (n = 3), RHD*weak D type 23/01N.16 (n = 1), RHD*weak D type 25/01N.01 (n = 1), RHD*weak D type 71/01N.01 (n = 1), RHD*weak D type 95/01N.01 (n = 1), RHD*weak D type 111/01N.01 (n = 1), RHD*weak D type 136/01N.01 (n = 1), RHD*979/981/D/C/T/C/RH/D-CE1-10 (n = 1) and RHD*01EL.01/DE12 (n = 2), were identified in the 30 donors by the MLPA analysis and RHD gene sequencing. Besides, a novel RHD variant allele defined by the missense mutation located in the exon 4 of the RHD gene (c.497A>G, p. His166Arg) was identified by sequencing in one donor with a partial D phenotype showed by the panel anti-D reagents (D-Screen), RHD*4970G/D01N.01 and Cere genotypes were determined by the MLPA analysis.

Summary/Conclusions: Except for the RHD variant alleles reported in the Chinese population before, RHD*weak D type 23 and RHD*weak D type 111 identified in the Japanese, and RHD*weak D type 95 and RHD*weak D type 136 detected in the French were firstly identified in the Chinese Han. The amino acid (p.166Arg) encoded by the novel missense mutation (c.497A>G) located in the 3rd extracellular loop of Rhd protein, which also indicates to resulting in a partial D phenotype.

A CASE STUDY OF RH BLOOD CHIMERISM

Background: A 55-year-old male donor was found to have mixed field reaction in Rh typing. He had no prior history of blood transfusion or transplantation. The red cells of this healthy blood donor presented a typical mixed-field agglutination pattern with Anti-D, Anti-c and Anti-E. Further serological and genotyping analysis of D variants has systematically conducted in the Chinese Southern Han donors with D negative phenotype, because it's detectable only by the adsorption-elution test using anti-D regents which is not routinely performed in the clinical laboratories and blood centers in China.

Results: After separation of RBC mixture, there were two cell populations typed as D-C=c-e-e+ and D-C=c-e+e by serological tests. Flow cytometry analysis revealed two main cell populations and the amount of D antigen expression were 5% D-positive cells (DcEe) and 95% D-negative cells (dcEe). The result of PCR-SSP for RHD*1227G-A allele was positive, corresponding with the dcEe phenotype which was suspected to be DcE and the RHD zygosity test was negative which indicated no RHD gene deletion.

Summary/Conclusions: Rh chimerism of this case is considered to be naturally occurred since the donor had no hematological diseases and twin sibling. The results suggest that there were two different Rh genotypes DEL-cE and D-cE existing in the donor resulting in the expression of two populations of blood cells (DcEe and dcEe).

RHD GENOTYPING ANALYSIS IN THE CHINESE SOUTHERN HAN DONORS WITH D VARIANT PHENOTYPE

Background: RHD genotyping of D variants has systematically conducted in the Caucasian population, but not completely in the Chinese population. So far, less than 60 RHD weak or partial alleles have been identified in the Chinese population. RHD*weak partial 15 and RHD*DVI.3 are the most common RHD variant alleles, accounting for more than 65% of the reported Chinese D variants individuals.

Methods: To establish a high-resolution melting (HRM) method for rapid genotyping of “Asian type” DEL with the RHD*1227A ALLELE

Background: The DEL phenotype is often labeled as D negative phenotype, because it's detectable only by the adsorption-elution test using anti-D regents which is not routinely performed in the clinical laboratories and blood centers in China. Compared with the rare distribution in the Caucasian and Black populations, the DEL phenotype is very common in East Asia population with a frequency of 15%-32% in the apparent D negative individuals. More than 95% of Chinese DEL individuals carry the RHD*1227A allele. An increasing number of studies proved that the epitopes of “Asian type” DEL are intact and could not immunized by D blood. Therefore, the individuals of “Asian type” DEL recipients should be treated as D positive individuals. Currently, PCR-SSP method and a real time PCR with a previous step of PCR-SSP and a last step of melting curve analysis has been developed for detection of RHD*1227A, but these methods are not suitable for routine genotyping for time-consuming or complicated operation steps needed.

Aims: To establish a high-resolution melting (HRM) method to genotyping “Asian type” DEL phenotype with the RHD*1227A allele.

Methods: One pair of RHD specific primers was designed to amplify the exon 9 of the RHD gene covering the missense mutation (c.1227G>A) with a length of 135 bp for PCR product. Real time PCR and high-resolution melting steps were performed in one closed-tube continuously on the Roche LightCycler®480 qPCR instrument. Forty-five samples with a known genotype carrying the RHD*1227A allele, which obtained by using the RH-multiplex ligation-dependent probe amplification (RH-MLPA) assay and sequencing of RHD exon 9, were tested by the developed HRM method. Wild-type samples without RHD*1227A allele were used as the negative control.

Results: Among the 45 samples, three groups samples, including three samples having a homozygous RHD*1227A/1227A genotype, 1 sample having a RHD*1227A/1227G genotype and 41 samples having a RHD*1227A/D01N.01 (RHD deletion) genotype, and the wild-type control samples could be classified into four different groups having a different melting curves shape with each other by HRM. The genotypes for RHD*1227A of HRM were consistent with the results of MLPA. In summary, the total time of the genotyping process including the manual DNA extraction, the pipetting steps and the machine running time took less than 2 h.

Summary/Conclusions: HRM is a simple and rapid method for genotyping of “Asian type” DEL that is suitable to be used in the routine testing to prevent the unnecessary RhD prophylaxis in the “Asian type” DEL pregnant women.
A HYBRID RHCE A LLE LE, RHCE(1)-(D)-(2)-(CE)-(3-10), CAUSE AN UNSUAL RH– PHENOTYPE

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Background: D− lacks all RHCE antigens and is a very rare phenotype. The molecular background of D− is heterogeneous, including mutation or deletion of the RHCE gene and nonfunctional hybrid RHCE-D-CE allele.

Aims: We describe a novel molecular background in a D− patient with a potent anti-RH17.

Methods: Blood sample of a female patient was referred to our reference laboratory because of the presence of an anterythrocyte antibody. Rh typing of the patient and her family members were performed by standard hemagglutination techniques. Genomic DNA of the patient and her family members were extracted from peripheral blood cells using a fully automated device. RHD and RHCE alleles were identified by Polymerase chain reaction (PCR) assay and sequencing on the 10 exons of the RHD and RHCE genes.

Results: The patient, group A1, D−, had six deliveries and 4 children died soon after their birth. Serological studies showed an IgG 37°C-reactive alloantibody which reactivated with all cells in the panel. Proposito’s red blood cells were positive for the anti-Ds tested and failed to react with anti-C, anti-c, anti-E and anti-e antisera. She was then diagnosed to be D− with a potent anti-RH17 in her serum. Adsorption-elution tests with polyclonal anti-C, anti-E, anti-c and anti-e were negative. The phenotype of Proposito’s brother, daughter and niece were DccCE and DCCee, respectively. Genomic DNA sequencing of the 10 RHCE exons revealed that a homozygous hybrid RHCE allele, RHCE(1)-(D)-(2)-(CE)-10, was existed in the proposito. The exon 2 of RHCE was replaced by homologous RHD. Thus, this allele could not code normal RhCE protein and therefore resulted in RHD− phenotype. The same hybrid RHCE allele, RHCE(1)-(D)-(2)-(CE)-10, was also found in one DNA chain of Proposito’s daughter. RHCE genotyping of Proposito’s brother, and niece did not show any mutation. And RHD genotyping of Proposito and all her family mentioned above did not show any mutation.

Summary/Conclusions: We report here a unique nonfunctional hybrid RHCE(1)-D(2)-(CE)-10, found in one DNA chain of Proposito’s daughter. RHCE genotyping of P-436 Chinese patient.

Results: The patient, group A1, D−, had six deliveries and 4 children died soon after their birth. Serological studies showed an IgG 37°C-reactive alloantibody which reactivated with all cells in the panel. Proposito’s red blood cells were positive for the anti-Ds tested and failed to react with anti-C, anti-c, anti-E and anti-e antisera. She was then diagnosed to be D− with a potent anti-RH17 in her serum. Adsorption-elution tests with polyclonal anti-C, anti-E, anti-c and anti-e were negative. The phenotype of Proposito’s brother, daughter and niece were DccCE and DCCee, respectively. Genomic DNA sequencing of the 10 RHCE exons revealed that a homozygous hybrid RHCE allele, RHCE(1)-(D)-(2)-(CE)-10, was existed in the proposito. The exon 2 of RHCE was replaced by homologous RHD. Thus, this allele could not code normal RhCE protein and therefore resulted in RHD− phenotype. The same hybrid RHCE allele, RHCE(1)-(D)-(2)-(CE)-10, was also found in one DNA chain of Proposito’s daughter. RHCE genotyping of Proposito’s brother, and niece did not show any mutation. And RHD genotyping of Proposito and all her family mentioned above did not show any mutation.

Summary/Conclusions: We report here a unique nonfunctional hybrid RHCE(1)-D(2)-(CE)-10, found in one DNA chain of Proposito’s daughter. RHCE genotyping of P-436 Chinese patient.
phage clones which can specifically binding to this IgG monoclonal anti-D and its DNA sequences were obtained by Phage-Display technology.

Aims: This study was purposed to predict the antigenic epitopes of RhD protein and investigate the factors of screening peptide mimotopes of blood group D carbohydrate-antigen via phage display peptide library, then to evaluate the best program for screening, in order to obtain the mimetic antigen epitopes of RhD blood type antigens.

Methods: 1. To predict the antigenic epitopes of the RhD protein by bioinformatics technology. 2. By comparing the phage titers of eluent in each experiment with different elution time (4, 8, 12, 16 and 30 min). 3. By comparing the input/output ratios and P/N values in each round panning with different concentration of Tween20 in washing buffer and different blocking buffer types. 4. By analyzing the effect of screening to obtain the best program for screening. Then by using ELISA to analyze the binding forces of IgG monoclonal anti-D and eluted solution in each round panning. 5. Do the DNA sequencing to obtain the mimetic epitopes of RhD blood type antigens, then do the antibody competition inhibition assay and agglutination inhibition test.

Results: 1. The predicted antigenic epitopes were found to locate at the protein sequence of amino acids 36-41, 100-104, 353-356 for RhD. 2. After comparing the influencing factors of screening, the best program for screening is “the elution time is 8 min, the washing buffer of 0.1%, 0.5%, 0.9% Tween20 and the blocking buffer of 0.5% BSA, 1% Gelatin, 5% skimmed milk in each biopanning round”. 3. By using the best program, the binding forces of IgG monoclonal anti-D and eluted solution in each round panning are enhancing. 4. One major mimic peptides (“VHWDFRQWWQPS”) with about 50% inhibition ratio were obtained. The phages with this peptide sequence are able to inhibit the agglutination of IgG monoclonal anti-D and D+ cells in a concentration dependent manner.

Summary/Conclusions: 1. The findings of the prediction would be helpful to predict the antigenic epitopes localized within human RhD. 2. The screening efficiency was affected by elution time, the concentration of washing buffer and the kind of blocking buffer. The screening procedure is optimized in this study. 3. The mimic peptides we obtained is able to inhibit the reaction of RhD blood type antigen and IgG monoclonal anti-D.
position -46 from the 3' end of intron 9 were not found Jka-related polymorphisms in Chinese population. Aims: To study the weak Jk (a-b-) blood group phenotype associated with 130A at Exon 4 of the Jk gene in Chinese population. Methods: A lysis test was performed on 3800 samples by 2M urea. Jk phenotypes of 100 controls were detected by standard serology and the urea hemolysis test. Genomic DNA was isolated from white blood cells with a DNA extraction Kit. The sequences covering 4-11 exons and partial introns of Jk gene was amplified with genomic DNA by polymerase chain reaction, and fragments were directly sequenced. Results: 3 samples Jk (a-b-) from 3800 Chinese blood donors whose RBC reacted weakly with anti-Jk- and the urea hemolysis test was negative. Among the three Jk (a-b-) samples, two of which carried nt130GaG in exon 4 and JKB/JKR, the other one carried nt130G/A and JKA/JKB. The Kidd phenotypes of 100 controls were 24 Jk (a-b-), 43 Jk (a-b+) and 33 Jk (a-b-). Among 24 Jk (a-b-) samples 7 individuals carried 6 heterozygous nt130G/A, 17 homozygous nt130A/A and 1 homozygous nt130G/G, 7 of 43 Jk (a-b+)- samples carried homozygous nt130G/G, the other 36 individuals were heterozygous nt130G/A. 31 Jk (a-b-) samples carried nt130G/G. Homozygous for intron8 847T was found in all 103 samples. In addition, a new mutation was found, the G was substituted for A at position -235 from the 3' end of intron 4. Summary/Conclusions: 130A at Exon 4 of the Jk gene were not associated with Jk (a-b-) expression in this study. The allele occurrence with 130G is 37.5% in Chinese population. A novel allele with intron 4 -235A is 6.1%. Homozygous for intron8 847T in Jk gene was common allele in Chinese population.

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LEWIS Y ANTIGEN REGULATES HEPATOCELLULAR CARCINOMA CELL MIGRATION VIA MODULATION OF STRESS FIBER FORMATION

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Background: Histo-blood group antigen Lewis Y (LeY) is an isomer of blood group antigen Lewis B, and their synthesis pathways are closely related to each other and share various fucosyl transferases (FUTs). Anchoring on various glycoproteins and glycolipids, LeY plays an important role in cell recognition, adhesion as well as migration. LeY is also demonstrated to be significantly overexpressed or re-expressed in several tumor tissues and cell lines and correlated with the clinical metastasis of tumors. Aims: We analyze the effect of LeY on cell motility as well as the structure of cytoskeleton in hepatocellular carcinoma cells (HCC), to shed light on the molecular mechanism LeY utilizes to regulate cell migration, which can also be referenced in the studies of the clinical roles of other carbohydrate blood antigens. By confirmation of the role of LeY on cell migration, new transfusion strategies may be adapted with regard to possible roles of blood group antigens in tumor metastasis to improve transfusion safety. Methods: The migration ability and expression of LeY of two HCC cell lines SMCC-7721 and HepG2 is assessed and compared. SMCC-7721 cells transfected with siRNA against FUT1 was analyzed for LeY expression and cell migration. LeY antibody blockade experiment is also conducted to verify the role of LeY in cell motility. Immunostaining analysis is carried out on SMCC-7721 cells with FUT1 knockdown for cytoskeleton change using Phallidin which binds to F-actin. The results are visualized using Confocal Laser Scanning Microscopy. Results: As shown by Western Blot results, LeY relative expression level in SMCC-7721 is significantly higher than in HepG2, which is positively correlated with their migration capacity detected by Transwell Assay. LeY blockade using anti-LeY antibody significantly inhibits cell motility as demonstrated by Transwell and Wound Scratch Assay. Furthermore, FUT1 knockdown in SMCC-7721 leads to significant decrease in LeY synthesis and cell migration, while stress fiber amount is markedly reduced compared to cells treated by negative control siRNA. Summary/Conclusions: LeY antigen exerts positive effect on HCC cell migration, probably via regulating the formation of stress fiber structure. The underlying mechanism of signal transduction may involve the glycosylation of proteins carrying the LeY antigen. This provides us with novel ideas in studying other ABH blood group antigens. During transfusion practice, it may lower the risk of transfusion to take account of the significance of blood group antigens as tumor metastasis promoters.

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AMP DEAMINASE-3 VARIANTS IN AN AUSTRALIAN DONOR COHORT

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Background: The mechanism behind red blood cell (RBC) aging is largely unknown however, an enzyme that catalyzes purine nucleotide interconversion, AMP deaminase-3 (AMPD-3), has been reported to play a role in RBC longevity. Horlde and colleagues demonstrated that a gain of function mutation increased AMPD-3 enzyme, reduced RBC ATP, increased RBC GTP, decreased RBC lifespan and increased erythropoiesis in mice (Horlde et. al, Blood, 2016). We reviewed previously published mutations (R273C, Q433X, 600delE and 4311L), that were shown to decrease AMPD-3 enzyme activity. We hypothesize that this decrease in enzyme activity may impact on RBC lifespan. Aims: To investigate the prevalence of AMPD-3 mutations in an Australian blood donor cohort. Methods: Four AMPD-3 SNPs were chosen for investigation based on frequency and mutations that caused deletions/ frame shifts. Australian blood donors (n = 481) were genotyped using single nucleotide polymorphism (SNP) Taqman genotyping RT-PCR. R573C and Q433X were commercially available and 600delE and 4311L were custom designed (Invitrogen, Carlsbad, United States). Briefly, SNP assays containing fluorescent probes (VIC and FAM) were analysed performed according to manufacturer’s instructions with positive (plasmid) and negative controls. All reactions were performed in a StepOnePlus instrument and analysed using StepOne Software v2.3 (Applied Biosystems, Foster City, United States). Results: The prevalence of four known AMPD-3 SNPs were investigated in a cohort of Australian blood donors. Of the 4 SNPs investigated, R273C was reported to be the most prevalent (0.019%) in a Japanese cohort however we did not find this mutation in our Australian cohort. Both 600delE and Q433X were reported at a frequency of 0.0007% in previous studies however these were not found. The V231L genotype was reported in a Polish cohort with a prevalence of 0.013%. In the Australian cohort studied we found nine individuals heterozygous for the V311L mutation indicating a prevalence of 0.019%. Summary/Conclusions: Of the four AMPD-3 SNPs reported, only V311L was detected in an Australian blood donor cohort. Australia has a diverse multi-ethnic population, however, only the V311L mutation was found in Australian donors but not the “Japanese” R573C mutation. The V311L mutation is associated with decreased AMPD-3 enzyme function and therefore, further investigation of these nine blood donors into RBC AMPD-3 enzyme activity and impacts on nucleotide pool and RBC lifespan are warranted.

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THE KIDD BLOOD GROUP IS DISTRIBUTED AMONG THE BLOOD DONORS IN SOUTHERN ZHEJIANG

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Background: The Kidd blood group system is one of the most important blood group systems in blood transfusion. There are 2 common antigens on red blood cell: Jka antigen and Jkb antigen. Immunogenicity is weak, generally for foreign antigen immune ability of strong talent, anti -Jka and anti -Jkb can cause hemolytic disease of the newborn (HDN) and acute or delayed hemolytic transfusion reactions. Kidd antigen distribution shows polymorphism in all populations. At present, Jk (a-b-) rare blood type resource bank has not been established in the south of Zhejiang province.

Aims: The distribution pattern of Kidd blood group among donors in southern Zhejiang Province(Wenzhou, Taizhou and Lishui) was analyzed to provide a theoretical basis for establishing the rare blood bank of blood donors. Methods: Of the 36235 donors, 5 Jk (a-b-) phenotypes were screened, with a frequency of 0.014%. In 672 blood donors, the distribution of the Kidd blood group phenotype (frequency) of Jk (a-b-) (0.4777) > Jk (a-b+) (0.3184) > Jk (a+b-) (0.2039), no Jk (a-b-), the gene frequencies of Jka and Jkb were 0.4928 and 0.5072, by 2 test, Kidd type of observation value and the expected value had no significant difference (P > 0.05), Hardy-Weinberg in good agreement. Results: Of the 36235 donors, 5 Jk (a-b-) phenotypes were screened, with a frequency of 0.014%. In 672 blood donors, the distribution of the Kidd blood group phenotype (frequency) of Jk (a-b+) (0.4777) > Jk (a-b-) (0.3184) > Jk (a+b-) (0.2039), no Jk (a-b-), the gene frequencies of Jka and Jkb were 0.4928 and 0.5072, by 2 test.
Kidd type of observation value and the expected value had no significant difference (P > 0.05). Hardy-Weinberg in good agreement.

Summary/Conclusions: The Kidd population distribution is polymorphic and conforms to the Hardy-Weinberg population genetic balance law. Jk (a-b-) phenotype is found in blood donors, especially for the establishment of Jk (a-b-) rare blood type resource pool for clinical use.

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PARTICIPATION IN THE INTERNATIONAL EXTERNAL QUALITY ASSESSMENT IN MOLECULAR IMMUNOHEMATOLOGY FOR A CHINESE LAB: IMPLICATION FOR CLINICAL APPLICATION IN CHINA

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Background: Genotyping of blood groups can help solve many difficult serologically typing of red blood cell antigens. Introduced firstly since 1990, the molecular immunohematology method was rapidly being engaged in routine work in many developed countries and laboratory proficiency tests were established by external quality assessments (EQAs) since 2006. For the first time, a Chinese laboratory participated in the EQA in molecular immunohematology organized by INSTAND, a non-profit provider of proficiency tests, in October 2015.

Aims: The aim of this study is to improve the ability of genotyping in molecular immunohematology experiments and to facilitate clinical application of molecular methods in routine work in China.

Methods: PCR-Sequence Specific Primer (PCR-SSP) method was applied in testing 4 DNA samples distributed by INSTAND in Oct. 2015. The commercial kits purchased by our lab were able to detect the genotypes of RBC antigens from ABO, RHD, RHCE, Kell, FY, JK and MNSs systems. The genotyping results of the 4 samples were submitted by email to INSTAND within 2 weeks and then analyzed by specialists. The testing alleles and the criteria for passing the proficiency were supplied with samples by organizer.

Results: The genotyping results of the four DNA samples were as follows: no. 1, B/01, KEL2/KEL1, JKA/JKB, FYA/FYB, MNs, Cee, RHD Gen/gene (normal); no. 01/01, KEL2/KEL1, JKA/JKB, FYA/FYB, MNs, Cee, RHD Gen/gene (normal); no. 3, 01/01, KEL2/KEL1, JKA/JKB, FYA/FYB, NNSs, Cee, RHD Gen/gene (normal); no. 4, 01/01, KEL2/KEL1, JKA/JKB, FYA/FYB, MNs, Cee, RHD Gen/gene (normal). The certificate was given to us demonstrating that we had fulfilled the requirements for the molecular diagnostic of gene from ABO, RHCE, Kell, FY, JK and MNSs systems. For RHD gene, we only fulfilled normal typing of RHID instead of further RHID zygosity, weak D, partial D analysis or typing, therefore probably failed to pass the proficiency.

Summary/Conclusions: External quality assessment can be helpful for transfusion medicine laboratories to do well in molecular immunohematology. Participating the EQA test can maintain reliable level for Chinese labs when introducing the genotyping technology, and further allow more clinical application in China.

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RARE AND NOVEL ALLELES IDENTIFIED IN AN INDIGENOUS AUSTRALIAN POPULATION: APPLICATION OF GENOTYPING TO IMPROVE TRANSFUSION SAFETY
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Background: Extended blood group sequence data for Indigenous Australians has never been reported. Recently published genomic datasets make it possible to review variants in blood group genes and provide variant analysis. Identification of novel variants and variants found only rarely in other populations provides an evidence base for improved transfusion management.

Aims: To analyse blood group variants from whole exome sequence data generated by Tang et al. (2016; https://doi.org/10.1038/sdata.2016.23) for 72 Western Desert Indigenous Australian families.

Methods: Variants in genes for 36 blood group systems, and the transcription factors KLF1 and GATA1, were extracted from the dataset (.vcf), annotated and compared to those in public databases. Approval for data access and analysis was obtained from the Telethon Kids Institute (http://bioinformatics.childhealthresearch.org.au/AGHS). The possible impact of rare and novel missense variants were further investigated in silico using the meta predictor, Meta-SNP.

Results: For the MN system, a putative novel GYPAL allele predicting 20Leu and 24Gly was identified in 9% (6/72) of individuals; a combination of residues associated with N (20Leu) and M (24Gly) antigens.

In the RH system, the 16Cys RHCE variant was identified at a homozygous level in 41% (29/72) of individuals with the E haplotype; in 3 individuals with EE and in 12 with ee. This frequency is similar to a historic report for the lack of antigenic component E0 in 30% of Western Desert individuals with the E haplotype.

In the RI system, two novel RHDE substitutions (predicting p.Ser77Leu and p.Ala203Thr) at the same sites associated with known weak D alleles, were identified separately and at a heterogeneous level in 2 individuals.

In the D (Diego) system a novel variant (p.Gly647Ser) that is predicted to have a functional effect, occurred at the same site associated with the Swa antigen and was observed at a heterogeneous level in 5 individuals.

In the RHAG system, the RHAG-A associated variant was found in 37 samples. Predicted blood group phenotype profiles were similar to historic serology profiles.

In addition we noted that for the DO (Domrock) system, 67 individuals carried the Do0 variant (in Caucasians and Africans Do1 is higher frequency).

Summary/Conclusions: Blood group variants associated with known alleles, as well as rare and novel variants that have the potential to be immunogenic, were defined. The novel GYPAL allele is defined by positions that carry the antigenic determinants for the immunogenic MN blood groups. The association between 16Cys/E haplotype with the histidine E0 antigen requires investigation. The risk of developing anti-E0 in Indigenous Australians and associated transfusion reactions remains to be defined.

Antibodies against RHAG-A have been reported to cause severe HDFN. The variants analysed were for Indigenous Australians from Western Australia, the geographical distribution of these variants and more general applicability to transfusion practice remains to be defined.

P-452
APPLYING MOLECULAR IMMUNOHEMATOLOGY FOR DONORS AND PATIENTS IN NATIONAL BLOOD CENTER, MALAYSIA
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Background: The molecular basis of many blood group antigens is known, and it provides a means for predicting the red blood cell phenotype. Molecular typing is useful when serologic typing cannot be ruled out. We perform molecular typing for donors and patients who unresolved results by serologic findings. All samples were performed with molecular testing in order to confirm either subgroup, Rh D status or red cell genotyping. From the findings, it was found that 22 (24%) out of 91 samples showed discordance results between serological and molecular testing. The discrepancies were found in ABO blood group (12), Rh blood group (4) and red cell genotypes (6) cases.

Summary/Conclusions: Molecular typing is a helpful supplementary techniques for resolving most of the common problems caused by discrepant or doubtful serologic results.

P-453
VALIDATION OF RED CELL GENOTYPING KIT RBC-FLUOGENE VERYFY (INNO-TRAIN)
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Background: Red cell antigen typing is an essential step in antibody identification and subsequent transfusion of antigen-negative blood.

Aims: Conventional serological typing methods are simple and cost-effective, but have limitations in patients that are Direct Antiglobulin Test (DAT) positive or recently transfused.

Methods: RBC-Fluogene veryfy detection system is based on PCR SSP. This kit allows typing of Rh(D), Rh(C), Rh(c), Rh(E), Rh(e), Rh(C*) and Kell, Kidd, Duffy, MNS, Dombrock. 11 genotyping results were collated and analysed against known results using Chi Square Test, achieving P-value < 0.05 will be accepted as having been validated. 3 samples were sensitized with IgG (anti-D) to simulate strong positive DAT and compared with initial genotyping results. Genotyping kit is also evaluated using 4 recently transfused cases, with pre- and post-transfusion samples.

Results: Rh(C), Rh(c), Rh(E), Rh(e), Kidd, Duffy and MNS achieved the acceptable level of correlation. Rh(D) typing with one discrepant result, did not achieve the accepted level of correlation. Rh(C*) and Kell and Dombrock typing required a wider sample size to achieve P -value < 0.05. Results for both DAT positive and recently transfused cases showed complete concordance.

Summary/Conclusions: RBC-Fluogene veryfy genotyping kit can be implemented for laboratory use of Rh(C), Rh(c), Rh(E), Rh(e), Kidd, Duffy and MNS typing. Genotyping results of Rh(D), Rh(C*) and Kell and Dombrock required further testing before the required P -value could be achieved.

P-454
PREDICTION OF LINEAR AND CONFORMATIONAL B CELL EPITOPES OF CD36 PROTEIN
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Background: CD36 (or Platelet glycoprotein χ, SCARR83) is a transmembrane glycoprotein, a multi-ligand receptor, possesses various biological functions, influences various diseases including angiogenesis, thrombosis, atherosclerosis, malaria, diabetes, sepsis, dementia and obesity. CD36 is an isoantigen that can immunize CD36-deficient individuals to produce anti-CD36 antibody that may mediate isomune thrombocytopenia. The use of neutralizing antibodies to block CD36 antigen can rescue CD36-deficient individuals to produce anti-CD36 antibody that may mediate isomune thrombocytopenia. The use of neutralizing antibodies to block CD36 antigen causes inhibition of metastasis in human oral cancer. We studied the linear and conformational B cell epitopes of CD36 protein that may help to understand the pathogenicity and physiological mechanisms.

Aims: To predict the linear and conformational B cell epitopes of CD36 protein.

Methods: Based on the sequence of CD36 protein, transmembrane helices was predicted by the TMHMM and TMpred web servers. CD36 B cell linear epitopes were first predicted by using ABCpred, CoBEpis, BcePred, BepiPred web servers, and then located tertiary epitopes in the 3D structure of CD36 that constructed by homology modeling of Swiss-Model Workspace. The conformational epitopes of CD36 were predicted by Discotope, CITOPE, ElitPro and InterProSurf web servers.

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FREQUENCY AND MOLECULAR BASIS OF CD36 DEFICIENCY IN SHE POPULATION OF CHINA

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Background: CD36 is a multifunctional membrane receptor and is expressed in several cell lines. Individuals who lack platelet (PLTs) CD36 are at risk for immunization against this antigen, leading to several clinical syndromes. She is a minority in southern China. Aim: This study aimed to investigate the frequency and molecular basis of CD36 deficiency in She population of China.

Methods: Whole blood samples were collected from She population by random, and the PLTs and monocytes were analyzed using flow cytometry to determine CD36 deficiency type. After genomic DNA was extracted, Exons 3 to 14 of CD36 gene including a part of relevant flanking introns were amplified. Polymerase chain reaction-sequence based typing were performed.

Results: 160 She samples were analyzed, 3 individuals failed to express CD36 on PLTs; no one expressed no CD36 on their monocytes. These results demonstrated that the frequencies of Type I (lacking CD36 expression on PLTs and monocytes) and Type II (lacking CD36 expression on PLTs only) CD36 deficiency among the study population were 0 and 1.9%, respectively. Nucleotide sequencing analysis revealed two different mutations were 380C/T and 1228-1239delATTGTGCCTATT.

Summary/Conclusions: The study findings have confirmed the fact that the frequency of CD36 deficiency in the She population is similar to Han population in southern China. But significantly lower than the other minority population. Although the mutations are common types, there are unique characteristics of the frequency of CD36 deficiency in the She population.

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THE ESTABLISHMENT OF CELL LINES DERIVED FROM PLATELETS CD36 DEFICIENT AND THEIR APPLICATIONS

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Background: CD36(GPVI) is a glycoprotein of platelets, CD36 antigen deficiency individuals can immunized to CD36 through blood transfusion, pregnancy or transplantation and develop CD36 antibody (Ab). In Asians, CD36 Ab play important roles in immunity thrombocytopenia, such as CD36-related platelet transfusion refractoriness and neonatal alloimmune thrombocytopenia. CD36 antigen deficiency most cause by CD36 gene mutations. Currently, more than 30 kinds of CD36 gene mutations have been reported. Since the blood donors and patients with platelets CD36 deficiency cannot always maintain, the establishment of their immortalized cell lines will be able to permanently preserve the CD36 deficient genome DNA, to provide permanent experimental materials for the study of CD36 deficiency and related platelet immunology.

Aim: To establish the immortalized cell lines of platelets CD36 deficient, and to preserve these genetic resources permanently. It is of great significance for CD36 research and application of blood immunology, transfusion medicine and anthropology.

Methods: EB virus (Epstein-Barr virus) was used to transform the peripheral blood lymphocytes of blood donors and patients of platelets CD36 deficiency antigen into the immortalized cell lines, CD36 genotyping was by sequencing.

Results: We successfully established 111 platelets CD36 deficiency immortalized cell lines, CD36 gene defects include 329-330delAC, T538C, T200A, C1156T and C1409T et al. All the cell lines were revived after being frozen in liquid nitrogen, mycoplasma PCR detection found no mycoplasma contamination, no gene-mutations were found between before and after the cell lines were established.

Summary/Conclusions: The immortalized cell lines from platelets CD36 deficiency blood donors and patients passage stably, the genes of these CD36 deficiency types are permanently preserved and can be used as permanent experimental materials for the study of CD36 deficiency and related platelet immunology.

P-458

EXPRESSION OF CD36 AND CD36 DEFICIENCY IN THAI BLOOD DONORS

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Background: CD36 is a multifunctional membrane glycoprotein and expressed on the surface of several human cells, including platelets and monocytes. The expression of CD36 is variable among different individuals. There are two types of CD36 deficiency according to their surface expressions. In type I deficiency, CD36 is not expressed in both platelets and monocytes and in type II deficiency, CD36 is expressed on monocytes but not on platelets. Individuals who are CD36 type I deficiency may produce isoantibodies against CD36 which play a role on the mechanism
of immune-mediated platelet disorders including fetal and neonatal alloimmune thrombocytopenia (FNAIT), post transfusion purpura (PTP) and platelet transfusion refractoriness (PTR). Therefore, the information on the frequency of CD36 deficiency in a population is essential for evaluation of patients suffering from immune-mediated platelet disorders.

Aims: The objective of this study was to determine CD36 deficiency in 500 healthy blood donors at Blood Transfusion Center, Strinagarong Hospital, Khom Kaen, Thailand.

Methods: EDTA blood samples were collected from 132 platelet apheresis donors and 368 repeated whole blood donors. The expression of CD36 on platelets was determined by flow cytometry. For those individuals who did not show CD 36 expression on platelets, the expression of CD36 on monocytes was analyzed. The expression of CD36 on platelets and monocytes were assessed by median fluorescence intensity (MFI).

Results: Totally, 500 Thai blood donors were investigated. Positive CD36 expression was detected in 491 platelet individuals with the MFI ranged from 2.52 to 51.56. Mean and median of MFI ± SD in this group were 17.28 ± 9.59 and 15.46 ± 9.59, respectively. Nine donors lacked CD36 on platelets only (type II) and one of did not express CD36 on platelets and monocytes (type II). The results demonstrated that the frequencies of CD36 deficiency Type I and Type II in Thai blood donors were 0.2% and 1.6%, respectively.

Summary/Conclusions: This study indicates that the incidence of CD36 deficiency in Thai blood donors is similar to Chinese population living in Shanghai (Type I: 0.2%, Type II: 2.0%), which is slightly lower than those of other Asian populations (Type I: 0.5–1.0%, Type II: 2.0–5.8%). This information may useful for the risk prediction of isocytopenia against CD36 antigen in our population. Interestingly, the expression of CD36 is highly variable among individuals. This study may provide baseline information to study the relevance of CD36 expression with immune thrombocytopenia and other diseases.
Background: Platelet refractoriness and lack of platelet increase after platelet transfusion are seen in patients receiving chronic platelet transfusion. Antibodies may develop against HLA class I antigens and/or human platelet antigens (HPA). HPA systems have more than seventeen bi-allelic antigen polymorphisms in which a base pair substitution leads to change in an amino acid of a glycoprotein expressed on the platelet. Cross-match-compatible platelets can improve corrected count increments (CCI) in alloimmunized patients with platelet transfusion refractoriness (PTR). In addition, HPA and HLA typing in both patients and platelet donors are essential for the diagnosis and treatment of patients with PTR.

Aims: To study the polymorphisms of human platelet antigen (HPA) 1-17 and human leukocyte antigen (HLA)-A and -B loci among blood donors from The Bank of Platelet GenBank in Changsha Blood Center. Methods: 535 blood donors from The Bank of Platelet GenBank in Changsha Blood Center were involved in our study. We used a PCR-based method to detect HPA-1 to HPA-17, and HLA-2 location alloantigens. Polymorphisms of mentioned HPA systems were determined by polymerase chain reaction-sequence specific primers (PCR-SSP), and HLA systems were determined by sequence based typing (PCR-SBT).

Results: The frequencies of HPA-1a, -1b, HPA-2a, -2b, HPA-3a, -3b, HPA-4a, -4b, HPA-5a, -5b, HPA-6a, -6b, HPA-Gova, -Govb were 0.0000, 0.0155, 0.9934, 0.0973, 0.0671, 0.0704, 1.0000, 0.0044, 1.0000, 0.0044, 1.0000, 0.0121, 0.6925 and 0.7699, respectively. The HPA-14 and HPA-16 showed no heterozygosity as the b allele was not detected in those loci. The most common HPA genotype combination was HPA-[1-6, Gov]-aa-3a-2ab-4aa-5aa-6aa-Govab (0.2074). The frequencies of HLA-A and -B demonstrated that HLA-A2 (0.4683) and HLA-B40 (0.2342) are the highest frequencies at their respective loci.

Summary/Conclusions: The distribution of HPA and HLA polymorphisms show a significant ethnic and territorial difference. The alloimmunization due to HPA-2, -3, -6 and Gov antigens need to be emphasized in Changsha populations.

P-464
972 CASES OF HPA-18 ANTIGEN GENE POLYMORPHISM INVESTIGATION IN HAN POPULATION OF NANJING CHINA
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Background: Since Newman PJ et al found that platelet PIA1 and PIA2 antigen was named HPA-1a/b, it has been discovered and named HPA-18. Nanjing is located in the junction of the North and South of China, and in the East Asian region on the west coast of the Pacific Ocean. Through the investigation of HPA-18 gene polymorphism of Nanjing Han population, we can not only carry out platelet matched transfusion, but also comprehend the differences of HPA polymorphism between Nanjing and the other parts of the world.

Aims: HPA alleles have different frequency distribution in different nations and regions. In order to understand the situation of HPA genetic polymorphisms among Nanjing population, which would facilitate clinical platelet matched transfusion. Methods: In this study, we investigated the polymorphism of Human platelet antigen (HPA)-18 in Chinese Nanjing Han population using the polymerase chain reaction with sequence-specific primers (PCR-SSP). Blood samples were collected from 972 unrelated healthy blood donors in Nanjing Han population, from age of 18-55.

Results: According to the analysis of 972 cases HPA-18 results among Chinese population in Nanjing region, the a and b loci in HPA-1-18, -15 illustrated different polymorphism distribution. Among them, the frequencies of HPA-1a/-1b, HPA-15a/-15b present highly polymorphic, which are 0.567/0.433, 0.507/0.493 respectively. While a allele frequency of HPA-1a~1b, HPA-4~6 is higher and b allele frequency is very low. The b locus of HPA-7~17, 19~21 was not detected. According to the Hardy-Weinberg equilibrium, the P value of a, b locus of HPA-1-2, 4-6, 15 present fit expectations (P > 0.05) while HPA-3, 5 did not (P < 0.05). The results indicated that they were from the same Mendel group. It may be due to the mobility and migration of the Chinese population in recent years.

The frequencies of HPA-1a/b allele in Nanjing were 0.998399 and 0.003601 respectively, which are close to Japanese, Korean, Thailand, Vietnamese, Taiwan, and other region of east Asia. As the known information pointed, HPA-1a/b allele frequencies in East Asia are the highest, which were significantly higher than that of the Mediterranean coast, such as Greece, Lebanon, Morocco, Spain, Switzerland, Tunisia. It is also higher than some African and European countries. The frequency of polymorphism of HPA-13b/a and HPA-15a/b in Nanjing region is almost the same with that in all regions of the world ranging from 0.4 to 0.6.

Summary/Conclusions: The results show significant difference of HPA allele polymorphism in Nanjing area when compared with some countries. Acknowledgements: This work was supported by grants from the Jiangsu Province natural science funds BK20131440.

P-466
A MODIFIED MAIPA METHOD
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Background: The monoclonal antibody immobilization of platelet antigens assay (MAIPA) is the gold standard in detecting platelet-specific antibodies. However, detection of anti-HPA15 has proven difficult, primarily due to low and variable expression of the antigen.

Aims: A modified monoclonal antibody immobilization of platelet antigens assay (MAIPA) is the gold standard in detecting platelet-specific antibodies. However, detection of anti-HPA15 has proven difficult, primarily due to low and variable expression of the antigen.

Methods: 1) Platelets are incubated with plasma. 2) Incubation with biotinylated glycoprotein-specific antibody. 3) Platelet are lysed. 4) Incubation with streptavidin coated beads. 5) Incubation with an anti-human IgG-PE. 6) Incubation with anti-human IgG-PE. 7) The fluorescence is measured by flow cytometry, on 1000 gated beads.

Results: The beads-MAIPA present superior signal-to-noise resolution (8-fold higher) to standard MAIPA. Moreover, it is more sensitive in quantification of anti-
HPA-1a. The lower limit of quantification was 0.5 IU/ml, compared with 1 IU/ml for standard MAIPA.

Summary/Conclusions: The use of biotin and streptavidin as well as flow cytometry can improve the sensitivity of MAIPA. Thus, this modified method has the promise to be popularized.

P-467
MICROARRAY PROFILING OF CIRCULAR RNAs IN HUMAN IMMUNE THROMBOCYTOPENIA PATIENTS
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Background: Dysregulated expression of circular RNAs (circRNAs) has been demonstrated as being implicated in a variety of human diseases. However, the expression profile of circRNAs in immune thrombocytopenia (ITP) has not been discussed.

Aims: Here, we aimed to determine circRNA profile in peripheral blood mononuclear cells (PBMCs) from ITP patients to improve our understanding of ITP pathogenesis.

Methods: Expression profile of circRNAs in PBMCs from 3 ITP patients and 3 healthy controls were analyzed by microarray assay. Several circRNAs were selected for validation using real time-quantitative PCR (qRT-PCR) in 30 ITP patients and 30 control subjects. MicroRNA (miRNA) target prediction software identified putative miRNA response elements (MREs), which were used to construct a network map of circRNA-miRNA interactions for the differential circRNAs.

Results: Among 184 differentially expressed circRNAs, 62 were upregulated and 122 were downregulated in ITP patients. The validation study demonstrated that hsa_circ_0008212, hsa_circ_0009181 and hsa_circ_0001439 levels were elevated in PBMCs of ITP patients whereas hsa_circ_0007011, hsa_circ_0008584 and hsa_circ_0000453 were downregulated. These circRNAs targeted complementary microRNA response elements. Hsa_circ_0008212 showed interactive potential with two immune-related miRNAs (mir-125b and mir-146a).

Summary/Conclusions: The present study performed circRNA profiling of PBMCs from patients with ITP and the results may aid in the understanding of the regulatory mechanism of ITP.

P-468
ESTABLISHMENT AND APPLICATION OF PLATELET ANTIGEN PANEL CELLS IN HEILONGJIANG
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Background: Human platelet antigen (HPA) has specific immunogenicity, which can produce corresponding antibodies through immune factors such as blood transfusion, pregnancy, and so on. Resulting in ineffective platelet transfusion, such as platelet immune abnormalities. To establish the specific platelet antigen panel cells in this region, and to lay the technical foundation for the identification of platelet isoantibody, so as to provide the necessary technical guarantee for the diagnosis and treatment of platelet immune abnormalities.

Aims: To establish human platelet antigen panel cells and apply it to detect and identify platelet antibodies.

Methods: The genotype of platelet antigen HPA-1a-16 of 419 voluntary unpaid blood donors in Heilongjiang area was analyzed by PCR – SSP technique. According to the results the type O platelets were selected to establish platelet antigen panel cells.

Results: 8 platelet cells which phenotype are consistent with genotype and covered 11 antigens in HPA-1a-16 and 15 systems were selected, Platelet antigen panel cells has been established and applied to the detection and identification works.

Summary/Conclusions: The platelet specific antigen panel cells has been successfully established. The results provide an experimental basis for the diagnosis and research of platelet immune abnormalities.

P-469
Abstract has been withdrawn

P-470
ASSOCIATION OF HUMAN PLATELET ANTIGEN POLYMORPHISMS WITH PLATELET COUNT AND MEAN PLATELET VOLUME
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Background: Recent genome-wide association studies have identified a number of single nucleotide polymorphisms associated with platelet count and mean platelet volume (MPV). However, it remains unclear whether human platelet antigens (HPA) polymorphisms are associated with platelet count and MPV.

Aims: The aim of this study was to determine the association of the HPA-2, -3, -5 and -15 polymorphisms with platelet count and MPV.

Methods: The HPA were genotyped by 5‘-nuclease assay in 139 healthy Chinese Han individuals, while platelet count and MPV from the same samples were measured using an hematology cell analyzer.

Results: The platelet count was significantly lower in the individuals with genotype HPA-1a-a than in those with HPA-1a-b (P = 0.030). While the platelet count was significantly higher in individuals with genotype HPA-5a-a than in those with HPA-5a-b (P = 0.045), and in individuals with genotype HPA-15a-a than in those with HPA-15a-b/b (P = 0.032). However, genotype HPA-3a-a and HPA-3a-b/b have no significant impact on platelet count (P = 0.084). In addition, the MPV was significantly lower in individuals with genotype HPA-5a-a than in those with HPA-5a-b/b (P = 0.001). The MPV did not differ among polymorphisms, such as HPA-2, -3 and -15.

Summary/Conclusions: This study demonstrated that HPA-2, -5 and -15 polymorphisms are associated with the platelet count, and HPA-5 polymorphism is shown as an independent factor for MPV. This finding will improve the understanding of the association of HPA polymorphisms with platelet-related diseases.

P-471
DEVELOPMENT OF ANTI-FOULING DETECTION METHODS FOR NOVEL PLATELET LIGANDS AND PATHOGENIC PLATELET ANTIBODIES
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Background: Fibrinogen (Fg) binding to platelet integrin αIIbβ3 (GPIIbIIIa) for the past half century has been considered essential for platelet aggregation to occur. However, we have found that in the absence of Fg and VWF platelet aggregation persists but in β1/–/– murine models platelet aggregation is arrested, indicating that this Fg-independent platelet aggregation is mediated by an unknown ligand(s) of αIIbβ3, termed the X-ligand(s) (JCI 2000, JTH 2006, Blood 2009). Additionally, ligands of GPIbα, another major platelet surface receptor, have not been fully explored, especially under Fg/–/– conditions. Therefore, it is completely unknown what these αIIbβ3 and GPIbα ligands are, how they regulate hemostasis/thrombosis, whether they affect platelet quality during storage, and whether they can be used for transfusion or if they cause adverse effects in patients following transfusion.

Immune thrombocytopenia (ITP) is a common bleeding disorder caused primarily by autoantibodies against platelet αIIbβ3 and/or GPIbα. Currently intravenous immunoglobulin (IVIG) is a first line treatment for ITP. We first reported, and others have confirmed, that anti-GPIbα antibody-mediated ITP is often refractory to IVIG therapy (Blood. 2006). Approximately, 20-40% of ITP patients have autoantibodies against GPIbα, hence, identification would help guide physicians towards proper treatment and conserve IVIG. However, the “gold standard” assay for anti-platelet autoantibodies, MAIPA, is unreliable and is rarely clinically utilized, leaving clinicians to rely on empirical treatment. Furthermore, identification of these αIIbβ3 and GPIbα interactions remains challenging as many assays suffer from high background signal or false positives due to non-specific binding (NSB) interactions.

Aims: The aim of this study is to develop an anti-fouling (NSB resistant) detection strategy for the identification of novel ligands of αIIbβ3 and GPIbα and pathogenic anti-platelet antibodies.

Methods: We have developed novel organosilane and organothiol based self-assembling monolayer (SAM) coatings that feature either αIIbβ3 or GPIbα covalently and site-specifically immobilized. Organosilane monolayers can be applied to hydroxyl-terminated surfaces such as glass and silica, while, organothiol SAMs are used on metal surfaces such as gold and copper. The coatings were synthesized on glass.
Granulocyte Immunology

P-472
ANALYSIS OF WHITE CELL ALLOANTIbODIES IN THE PATIENTS WITH TRANSFUSION REFRACTORINESS
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Background: Platelet transfusion is a necessary treatment of patients with cancer, hematological malignancies, bone marrow failure and hematopoietic stem cell transplantation. However, only a few studies mentioned that the specificities of HLA and HNA alloantibodies are among these patients.

Aims: To analyse white cell alloantibodies in the patients with transfusion refractoriness.

Methods: A total of 82 medical records of patients who were refractory to random single-donor apheresis platelets between January 2015 and December 2015 were enrolled. HNA and HLA antibodies in patient serum were screened by Luminex. The specificities of human leukocyte antigen (HLA) class I/II and HNA alloantibodies were determined by Luminex Single Antigen and by flow cytometry, respectively.

Results: Anti-HLA-UII alloantibodies were found in 38 of 82 (46.34%) patients, including 10 of 82 (12.19%) with anti-HLA-III alloantibodies only, 2 of 82 (2.44%) with anti-HLA-II alloantibodies only and 26 of 82 (31.70%) with both anti-HLA-I and anti-HLA-III antibodies. The highest expression of anti-HLA-I specificities was A9 (46.3%), A*0201 (11%), A*1101 (7%), A*1902 (6%), B*4403 (8%), B*3501 (8%), B*22 (25.2%), DRB1*0402 (29.4%), -DRB1*09 (18.7), respectively. Anti-HNA alloantibodies were found in 2 of 82 (2.44%) patients. The anti-HNA specificities were anti-HNA-2. One sample was anti-HNA antibodies with unknown allospecificities.

Summary/Conclusions: In this study, we tried to find the alloimmunization trends in patients after multiple transfusions and detect anti-HLA-UII and HNA antibodies among these patients.

P-473
HEMOLYSIS POLARIZES MACROPHAGES INTO A M1 PHENOTYPE
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Background: Hemolytic anemia is caused by the increased destruction of red blood cells (RBCs) in vivo, which leads a great challenge to blood transfusion. RBC destruction happens mainly by a direct lysis. The hemolysis produces and accumulates debris. The immune response to RBC debris is not fully understood yet. Mono-cyte-macrophages are intravascular sweeper, and macrophages can develop into classically (M1) or activated cells (M2) under different stimulation. It is unknown that which subset of macrophages plays a role on the elimination of RBC debris.

Aims: Since there is a paucity of data about the effects of hemolysis on macrophage phenotype, we explored how RBC debris polarized macrophages.

Methods: RAW264.7 and THP1 cell lines were incubated with RBC lysate for 2 days. Then transmission electron microscopy (TEM) was employed to observe macrophage morphology. We also analyzed the morphological changes of scanning electron microscopy (SEM). The IL-10, IL-12p70 and TNFα cytokines were measured by ELISA.

Results: According to TEM, we found that the RBC lysate resulted in increased spikes on the surfaces of macrophages. The cytokines concentration of IL-12p70 and TNFα increased, while the IL-10 content decreased compared with that of control group. The F4/80+/CD206+ cells number (M2) were fewer, while the F4/80+/CD206+ cell number (M1) increased than control group consistent with above observation. M1 cells increased and M2 cells decreased in bone marrow and spleen in hemolysis mice.

Summary/Conclusions: Collectively, the current investigation demonstrated that hemolysis polarized macrophages towards a pro-inflammatory M1 phenotype.

Fetal-Maternal Immunology

P-474
MOLECULAR ANALYSIS OF ANTI-D ALLOIMMUNIZATION IN D NEGATIVE PREGNANCIES
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Background: D- blood group is rare with a frequency around 0.3% in Chinese population. For Chinese D- pregnant women, they only have less 3% chance to have a D- baby for the frequency of heterozygous of D genotype is only 6% in the Chinese D- individuals. Thus, almost every pregnancy of D- Chinese women has a risk of anti-D immunization. Furthermore, lacking of treatment experience as well as expensive Rh immune globulin prophylaxis, make it difficult to treat and prevent HDFN caused by anti-D. However, anti-D production does not actually occur in Chinese pregnant women as frequently as expected. Anti-D alloimmunization seems to keep a low level according to recent studies in the Chinese D- pregnant women. Aims: The aim of this study was to systemically analyze anti-D alloimmunization and the molecular genetic background in D- pregnant women from Shandong area of China.

Methods: 102 unrelated pregnant women from Shandong area were selected for this study who were serologically typed as D negative during May to July 2017. The D antigens (using anti-D reagents with clone numbers TH-28, MS-26 and Rum-1) as well as irregular antibody were further analyzed by IAT while RhCce phenotype was determined by saline method. For the samples with positive IAT test of D anti-gen, the adsorption-elution test was applied with two kinds of anti-D mixes and acid elution and detected the elution liquid in gel card to determine the DEL phenotype.

Results: DNA of the DEL individuals were extracted. D variants and those which had produced anti-D antibodies, as well as additional 15 samples which had no anti-D antibody detected, were analyzed for RDH genotyping and/or zygosity using High-Resolution Melting (HRM), PCR-RFLP and Multiplex Ligation-dependent Probe Amplification (MLPA).

Summary/Conclusions: In this study we found that anti-D alloimmunization trends in patients after multiple transfusions and detect anti-HLA-UII and HNA antibodies among these patients.

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THE GENOTYPING AND ALLOIMMUNIZATION STUDY OF RHD ANTIGEN AMONG RH NEGATIVE PERINATAL WOMEN

P-477

TEST METHODS AND TREATMENT OF BLOCKED RHD ANTIGEN COMBINED WITH HDFN IN 3 NEONATES

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Background: ABO and RhD identification are especially important for transfusion and diagnosis of HDFN. Appropriate test methods and professional experience are crucial for detecting red cell antigens.

Aims: To discussion detecting methods and treatment of neonatal with blocked D antigen induced by high titer anti-D antibody.

Methods: Automated system, slide typing and tube typing combined with elution were used to detect RBC antigen. Unexpected antibodies and antibodies identification were detected by gel method.

Results: Two of the 3 neonates were twins. Two mothers had miscarriage history and transferred to our hospital at late pregnancy because of antibody screening positive. Anti-D was identified from maternal plasma and the titer was 1024. RhD antigens of 3 neonates were all negative identified by gel method (Grifols WADiana Compact, Spain), slide typing and tube typing, but anti-D and control column were all positive (4+) tested by automated system (ORTHO AutoVue Innova, USA), which was a combination of findings that cannot be accepted. After 45°C elution, D antigen showed 2+ positivity by tube typing, RhD genotyping later corroborated the positive D antigen of the newborn. Hemolytic tests showed that direct anti-globulin test(DAT) of 3 neonates were 4+ positivity, and antibody screening positive. Then anti-D was identified from plasma and elution liquid of neonates. Hemolytic disease induced by ABO incompatible can be excluded according to ABO blood type of neonates and mothers. ABO blood group identical with neonates and RhD negative blood were given for exchange transfusion. 3 neonates were treated successfully then discharged.

Summary/Conclusions: It is necessary to detect irregular antibody regularly for RhD negative pregnant. If a high titer of anti-D antibody was detected, coupled with hemolysis test results and clinical manifestations of neonate, even though RhD antigen of neonate was negative when tested by various methods, blocked RhD antigen should be considered. ABO blood group identical with neonates and RhD blood type identical with mother should be given when transfusion or blood exchange.
Background: Haemolytic disease of the fetus and newborn (HDFN) is characterized by the presence of IgG antibodies in the maternal circulation which can cause hemolysis in the fetus and newborn. The courses of HDFN may be ameliorated by the presence of IgG antibodies reacting with human leukocyte antigens (HLA) of the child in the maternal circulation.

Aims: To report the correlation between mother's IgG anti-A/B titer and HLA antibody post parturition and HDFN of maternal fetal ABO blood group incompatibility.

Methods: The samples were collected from clinical specimens of 91 cases of maternal fetal ABO blood group incompatibility of suspected HDFN from August 2014 to May 2016, of which 78 cases had histories of parturition (≥2), 13 cases of parturition for the first time. The titer of IgG anti-A/B antibody in mother serum was detected by micro-column gel agglutination assay. HLA antibodies in maternal serum were determined by LumineX. Three hemolytic tests were performed for the newborn (the test of sick newborn erythrocytic direct antiglobulin, detection of serum free anti-body and the identification of sick newborn erythrocyte dispersions) to determine the possibility of HDFN.

Results: (1) The incidence of HDFN was 67% when the IgG anti-A/B titer was <64 in the multiple parturitions group, while there was no HDFN when the maternal titer was <64 in the first parturition group. (2) In the multiple parturitions group, the incidences of HDFN in the cases of following IgG anti-A/B titer groups <64, 64, 128, 256, 512, >512 were 67%, 79%, 93%, 92%, 96%, 100%, generally showed an upward trend. (3) The difference in the multiple parturitions group, the positive rate of HLA antibody is 64%, and strong positive rate (cut-off≥3), and baseline >1000 was 32%, No HLA antibodies were detected in the first parturition group. (4) In the multiple parturitions group, the positive rates of HLA antibody in the cases of following IgG anti-A/B titer groups 64, 64, 128, 256, 512, >512 were 67%, 79%, 93%, 92%, 98%, 68%, showed no correlation trend.

Summary/Conclusions: (1) Even though the IgG anti-A/B titer was <64 for the women who have histories of parturitions and maternal fetal ABO blood group incompatibility, there is still the risk of HDFN. Accordingly, for the women who had histories of parturition and whose blood groupings were incompatible with their couples, the blood grouping and three hemolytic tests of the newborns should be performed in time after parturition, and the changes of bilirubin and hemoglobin in the fetus are closely observed. (2) The incidence of HDFN increased with the histories of parturition and the growth of IgG anti-A/B titer. The incidence of HDFN was extremely high when there were histories of parturition and whose blood groupings were incompatible with their couples, the blood grouping and three hemolytic tests of the newborns should be performed in time after parturition, and the changes of bilirubin and hemoglobin in the fetus are closely observed. (3) The production of HLA antibodies was positively correlated with the histories of parturition, and there was no significant correlation with IgG anti-A/B titer, and there was insufficient evidence for the association with HDFN. (4) This study was limited by the number of samples, and should be expanded to further study and draw more exact conclusions.
BACKGROUND: The most frequent cause of Haemolytic Disease of the Newborn (HDN) are due to IgG class anti-A and anti-B from AB0 blood group system, non-ABO blood type system can also lead to HDN. In addition to RH blood group systems, Kell, Kidd, Duffy and MNS antibodies can cause non-ABO HDN. In these blood group systems, there are differences in the blood group distribution of different races and populations, and there may be differences in the antibodies that produce HDN. Kunming is the capital of Yunnan province in China, with the Han nationality of 84.56 percent of the population, with ethnic minorities accounting for 15.44 percent of the city’s permanent population. The analysis and study of irregular antibodies of non-ABO hemolytic diseases in different areas are helpful to explore its clinical significance.

Aims: This paper provides a reference for prevention of HDN and blood exchange treatment in the region by analyzing the distribution of non-ABO HDN antibody in Kunming.

Methods: From June 2010 to June 2017, all cases of non-ABO HDN from 10 large tertiary hospitals in Kunming were analyzed retrospectively.

Results: The investigation found 93 cases of non-ABO HDN caused by irregular antibodies, including 89 irregular antibodies of Rh blood group system, 1 case as Lewis blood group system, 1 case for Kidd blood group system, 2 cases for M blood group system. In the irregular antibodies of Rh blood group system, 17 cases of anti-D, 41.58% (37/89); 25 cases for anti-E, accounting for 28.09% (25/89); 9 cases anti-Ec accounted for 10.11% (9/89); 5 cases anti-c, accounting for 5.62% (5/89); 5 cases anti-Dc, 5.62% (5/89); 2 cases anti-EC, accounting for 2.24% (2/89); 1 cases anti-Dr and DccEe, accounting for 1.12% (1/89).

Summary/Conclusions: Rh blood group antibodies derived from mothers are the major cause of Non-ABO-HDN. The anti-D antibody in Kunming caused the largest proportion of HDN, and the proportion of anti-E was second. Further research is needed to investigate strategies to prevent primary maternal RBC alloimmunization to RhD and to other blood group antigens, as well as to develop approaches to mitigate the dangers of existing maternal RBC alloantibodies.
HEMOLYTIC DISEASE OF A NEWBORN DUE TO RARE ALLOANTIBODY OF ANTI-DIB AND FAMILY PEDIGREE ANALYSIS

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Background: The D\textsuperscript{i} antigen usually occurs with high incidence, except in certain Asian and South American Indian populations. In general, hemolysis caused by anti-D\textsuperscript{i} is not severe and its clinical course is benign. The severity of hemolytic disease of the newborn (HDN) due to anti-D\textsuperscript{i} ranges from no symptoms to severe jaundice that requires exchange transfusion.

Aims: To report a case of severe hemolytic disease of the newborn caused by anti-D\textsuperscript{i}, and perform a pedigree analysis.

Methods: The baby was delivered by a 28-year-old Chinese woman who had a history of early miscarriage and a history of blood transfusion traced back to 14 years. The mother's irregular antibodies had not been screened during pregnancy. For the mother, an antibody screening and identification test was carried out, in addition to typing her primary red blood cell antigens. The newborn was required hospitalization because of jaundice with a total bilirubin (TB) level of 30.3 mg/dl and blood hemoglobin (HB) level of 13.5 g/dl on the third day after birth. Direct anti-globulin test, elution test and antibody screening and identification test for the newborn were carried out. The genotype of the Diego blood group system (D\textsuperscript{i} and D\textsuperscript{b}) of the families were typed by the PCR-SBT method.

Results: The newborn and the mother's blood groups of the erythrocytes were O, CD\textsuperscript{e}, and CD\textsuperscript{e}E, respectively. The neonate's erythrocytes reacted positively (1+1) in the direct anti-globulin test (DAT) and the serum reacted positively (2+) in the indirect anti-globulin test (IAT). The mother's serum and the eluate of the neonate's erythrocytes were reactive at high titer (1:512) with the entire panel of erythrocytes. The results of the maternal family study were as follows: the mother and her sister was Di(a-b\textsuperscript{+}), her parents, a brother, and the baby were all Di(a-b\textsuperscript{+}). Coincidentally, the baby's father is also Di(a-b\textsuperscript{+}). This study diagnosed that the mother had a rare blood genotype of Di(a-b\textsuperscript{+}) with allo-anti-D\textsuperscript{i}, which was determined to cause the hemolytic disease of the newborn. The newborn was stabilized after receiving phototherapy and high dose iv immunoglobulin therapy, but not suitable for exchanging transfusion. When the baby was discharged on the 10th days after birth, the level of serum TB was 5 mg/dl.

Summary/Conclusions: The case of hemolytic disease was caused by anti-D\textsuperscript{i}. But in China, most commercial antibody detection panels do not contain Di(b-) red cells, it is helpful to consider anti-D\textsuperscript{i} in routine antibody screening and identification test to ensure the clinical antibody can be detected.

THE IMMUNOLOGICAL ANALYSIS FOR ONE CASE OF FOETUS WITH ANAEMIA AND THROMBOCYTOPENIA CAUSED BY ANTI-CD36 ANTIBODIES

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Background: A Chinese female foetus was found with anaemia (haemoglobin 96 g/l) and thrombocytopenia (platelets 84 x 10\textsuperscript{9}/l) at 23 weeks of gestational age. Her mother, a CD36 deficient woman (Type I) with a history of foetal demise and/or hydrops several times, successfully gave birth to one hydropic foetus with severe anaemia and thrombocytopenia after intrauterine transfusions with CD36null RBC and platelet last year. This year the mother pregnant again, and the umbilical cord blood was obtained to analyse the impact of anti-CD36 antibodies on foetus.

Aims: To confirm the impact of anti-CD36 antibodies on this female foetus whose brother was found with severe anaemia and thrombocytopenia at 26 weeks of gestational age.

Methods: The antibodies binding on placentas and the surface expression of CD36 both on placentas and monocytes were measured using flow cytometry. A commercial Kit (PAKPLUS) was used to test anti-CD36 antibodies in umbilical cord or elution buffer of placentas. The molecular basis of CD36 was also analyzed by sequencing.

Results: Although anti-CD36 antibodies were detected in maternal serum at 23 weeks of gestational age by PAKPLUS, however, the intensity of anti-CD36 antibodies was a little bit lower than last year (OD, 1.484 vs 1.556). In contrast, anti-CD36 antibodies were not found in umbilical cord blood at 23 weeks and 27 weeks of gestation, respectively. Flow cytometry analysis showed normal CD36 expression on placenta as well on monocytes of the foetus. Interestingly, we found that the amount of CD36 expression on monocytes at 27 weeks of gestation decreased significantly compared to 23 weeks. Moreover, the platelets of foetus can directly react with goat anti-human IgG labelled with FITC using flow cytometry. By elution of foetus’s platelets, the anti-CD36 antibodies were also detected by PAKPLUS (0.34 vs 0.111). Like her brother, nucleotide sequencing analysis of CD36 gene revealed heterozygous carrying both the mutant of 329–330del AC and the wild-type allele. To improve the anaemia serial intrauterine transfusions with RBC from CD36null donors were performed. Finally the baby (2600 g, Apgar scores 10) was delivered vaginally at 37 weeks of gestation with normal haemoglobin.

Summary/Conclusions: In this case, although the anti-CD36 antibodies could not be detectable in foetal serum at mid-gestation, the anaemia and thrombocytopenia can also happen because of the binding of CD36 antibodies on platelets. For suspected FNAIT cases, it's necessary to do a series of immunological analysis to confirm the impact of anti-CD36 antibodies on foetus.

RARE B (A) SUBTYPE CAUSED HEMOLYTIC DISEASE OF THE NEWBORN AND ITS BLOOD TYPE IDENTIFICATION

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Background: So far, the significance of B (A) subtypes in clinical blood transfusion has been clarified, but hemolytic disease of the newborn caused by B (A) subtype has not been reported.

Aims: To analysis serological features of Hemolytic disease of the newborn caused by rare B (A) subtype and discuss the identification strategy of this blood group.

Methods: Serological methods were used to detect hemolytic disease of the newborn in 1 cases, and the characteristics of B(A) subtype were identified by serology,family surveys, molecular biology and so on.

Results: This is one case of hemolytic disease of the newborn caused by the rare B (A) subtype and only associated with relatively weak antigenicity of A antigen. We find 3 samples of B (A) subtype by family surveys. Genotyping and sequencing confirmed that three of them were haplotypes of CO and COCF.

Summary/Conclusions: Rare B (A) subtype can cause hemolytic disease of the newborn, which has important clinical significance, and its identification requires a variety of methods.

ANTI-JK3 INDUCED NEWBORN HEMOLYTIC DISEASE: INCLUDING PEDIGREE ANALYSIS

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Background: Natural or transfused immune anti-Jk3 present on Jk (a-b-) people were published, and anti-Jk3 has been responsible for severe immediate and delayed hemolytic transfusion reactions. Accidently, mother with anti-Jk3 never caused severe clinical problem on babies with direct comb test positive.

Aims: Pedigree analysis was conducted to reveal the genetic basis and serological features in a newborn with severe hemolytic disease caused by anti-Jk3 from the maternal plasma of an immunized Jk(a-b-) individual.

Methods: Kidd phenotyping and sequencing of whole gene SCLI4A1 were performed to evaluate the Kidd blood group. Antibody identification and direct antiglobulin test were conducted to detect anti-Jk3 in maternal and newborn plasma. The red blood cells of the newborn were also eluated using chloroform.

Results: The serological types according to ABO, RhD, and Kidd systems were B with Jk(a-b-) in the mother. The serological types according to ABO, RhD, and Kidd systems were B+ with Jk(a-b+) in the newborn and the father, and O+ with Jk(a-b+) in the mother.

Summary/Conclusions: The Jk(a-b-) phenotype was possibly caused by a mutation in the Jk(a) gene.

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Abstract has been withdrawn

P-492
ANALYSIS OF CLINICAL OUTCOMES OF COMPONENT TRANSFUSION IN VERY LOW BIRTH WEIGHT PRETERM INFANTS

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Background: Premature infants face double risk of bleeding tendency and thrombosis because of their special physiological characteristics. Component transfusion is considered as an important treatment to maintain oxygen supply, improve blood coagulation function and increase survival rate in very low birth weight (VLBW) premature infants. Smaller the gestational age and the lighter the birth weight, the more blood transfusions are being used. Domestic scholars reported for the VLBW preterm infants which have anemia with clinical symptoms of hypoxia should be timely treatment of blood transfusion, and the other scholars believe that blood transfusion lead to negative impact on survival of VLBW premature infants, which should be careful in blood transfusion decisions.

Aims: A retrospective analysis was made on the clinical outcomes of very low birth weight (VLBW) preterm infants with different transfusion times within the first 30 days after birth. To investigate the effect of blood component transfusion on the survival rate of children within 7 days after birth.

Methods: Clinical data of 97 cases who diagnosed as very low birth weight prematurity infants and received component transfusions before discharge from January 2015 to December 2016 in our hospital neonatal center were collected by using information retrieval system. A total of 60 cases were retrospectively analyzed. Use the blood component transfusion times within 30 days as the threshold to divide the cases into experimental group (blood transfusion times more than 5, n = 20) and control group (blood transfusion times ≤ 5, n = 40). To compare the two groups’ clinical observation indexes which included gender, birth weight, 1 min Apgar score, gestational age, the length of stay, blood transfusion times within 7 days after birth and complications, and use the Cox regression analysis to find out the factors influencing the prognosis of VLBW premature infants. Kaplan-Meier survival analysis was used to assess the classification variables of prognosis.

Results: (1) The difference of gender, 1 min Apgar score, the length of stay, bronchopulmonary dysplasia (BPD), and necrotizing enterocolitis (NEC) between the two groups were not statistically significant (P > 0.05); and the difference of gestational age, birth weight, postnatal transfusion times within first 7 days, and gastrointestinal bleeding were statistically significant (P < 0.05); (2) Single factor Cox regression analysis showed that gestational age, birth weight, postnatal transfusion times within first 7 days and gastrointestinal bleeding were the risk factors for VLBW preterm death; Cox regression analysis showed that gestational age less than 30W and postnatal transfusion times within first 7 days more than 2 were risk factors for VLBW premature infant death; Kaplan-Meier survival analysis of two indexes showed that for the infants with gestational age less than 30W, the survival time was shorter and the survival rate was lower, infants with postnatal transfusion times within first 7 days more than 2 had shorter survival time and lower survival rate.

Summary/Conclusions: Gestational age less than 30W and postnatal transfusion times within first 7 days more than 2 are risk factors for the prognosis of VLBW premature infants.

P-493
EPIDEMIOLOGY OF PEDIATRIC BURN AND TRANSFUSION STRATEGY FOR ESCHARECTOMY DURING THE STAGE OF SHOCK IN LARGE AREA BURN

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Background: Burn is an important cause of morbidity and mortality in pediatrics. As the development of various physiological organs in pediatrics is not perfect, the body’s tolerance to body fluid loss is worse than that of adults. As a result, pediatricians are more likely to suffer from shock after large area burns. In shock stage, the application of the wound scalpel can significantly improve the prognosis and improve the cure rate of large area burns. But cutting the scar may mean a large amount of blood loss in the patient, so in addition to the infusion of plasma anti shock during the shock stage, the red blood cells need to be transfused in time. However, there are few reports about the transfusion strategy during the shock stage of large area burns in pediatrics.

Aims: To analyze the epidemiological characteristics of burn and scald in pediatric and to explore the transfusion strategy for escharectomy during the stage of shock with large area burn.

Methods: The clinical closed loop intelligent path management and information evaluation system was used to retrieve 795 cases of burn and scald in pediatric under 14 years of age in our hospital from January 2014 to December 2016. The epidemiological characteristics of the gender, age, burn cause, burn site, burn place and resident location were retrospectively analyzed; 55 cases of extensive burn in shock stage were selected and compared with the control study. According to the different transfusion threshold divided into restrictive transfusion group (Hb>70 g/l, n = 25) and liberal transfusion group (Hb>100 g/l, n = 30), two groups of patients with clinical data, blood routine value, postoperative infection rate, complications, incidence of adverse transfusion events, length of stay hospital and 30 day mortality index were measured before and after blood transfusion.

Results: (1) 795 cases of burned pediatric in 1 ~<5 years of age group had the highest incidence, accounting for 83.6%; the main reason to burn was hot liquid scald (86.1%); see more complex to burn multiple sites (70.6%); burns below TBSA30% in mild and moderate burn area mainly (92.3%); most occurred at home (75%); the differences between groups were statistically significant (P < 0.05); (2) There was no significant difference in the general data of pediatric with extensive burn, shock stage and tangential excision (P > 0.05); (3) Compared with open blood transfusion group, the red blood cell count (RBC), hemoglobin concentration (HB) and hematocrit (Hct) were significantly increased after 24 h in transfusion in restrictive transfusion group, blood transfusion and the differences were statistically significant (P < 0.05); (4) The difference of postoperative infection rate, complications, incidence of adverse reactions, length of stay hospital and 30 days mortality rate between the two groups were not statistically significant (P > 0.05).

Summary/Conclusions: Supervision of pediatric (especially preschool) should be strengthened to reduce the harm of burns; Patients who were over >1 years old with severe burn and shock stage were treated with intravenous infusion of anti-shock fluid, Red blood cells were transfused according to the blood routine, condition and intraoperative blood loss of pediatric, Hb≥70 g/Las blood transfusion threshold is safe, effective and feasible.

P-494
A CASE REPORT OF HDFN CAUSED BY RARE ANTI-E, ANTI-C, AND ANTI-A ANTIBODIES FROM TYPE B MOTHER

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Background: Hemolytic disease of the fetus and newborn (HDFN) is an alloimmune disease caused by maternal antibody and fetal RBC agglutination. The concept of HDFN needs to be regarded as a financial and economic burden. HDFN diagnosis and treatment should be more attention.

Methods: The clinical and laboratory features of HDFN were reviewed in this report. Case with rare antibodies were also analyzed.

Aims: To analyze the blood type and antibodies of a newborn and his mother, and to choose the appropriate blood for the newborn’s treatment.

Results: Blood type of mother is type B, DCCee. Neonatal blood type is type AB, DCeEe. Anti-E and anti-c antibody were detected in serum from mother and neonate.

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newborn by using antibody screening and antibody identification. The mother's anti-body titer of anti-E and anti-c was 64 and 16 respectively before delivery. When type AB, DCCee leukocyte-poor red blood cells RBC was selected to do cross matching test with the newborn, the main side result was positive. By free and elution test, anti-A was found both in the newborn's serum and elution fluid and the titer was 4; the mother's antibody titer of IgG anti-A was 32. When type O or B, DCCee leukocyte-poor red blood cells RBC was selected to do cross matching test with the newborn, the result was consistent. We choose type O, DCCee washing RBC for the newborn's blood transfusion.

Summary/Conclusions: IgG anti-E, anti-c and anti-A were found both in the newborn's serum and elution fluid, and the neonatal hemolytic disease was caused by antibodies in and out of the ABO blood-group system. Generally, neonatal hemolytic disease happened in type 0 mother. The neonatal hemolytic disease of both in ABO and Rh blood-group system happened in type B mother was extremely rare.
Background: Hemolytic disease of the newborn (HDN) happens when mother’s blood group is incompatible with the newborn’s. It’s common seen in the newborns who have mismatched ABO and Rh blood group with their mothers.

Methods: 50 newborns with confirmed severe HDN (total bilirubin > 142 umol/l) between March, 2016 and March, 2017 are enrolled in the research. Blood tests are performed when HDN is diagnosed and after exchange transfusion therapy.

Results: Total bilirubin (from 412.58 ± 114.29 μmol/l to 165.64 ± 70.58 μmol/l) significantly decreased after exchange transfusion therapy, P < 0.05. Erythrocytes count (from 4.52 ± 0.78 to 6.21 ± 0.82) and hemoglobin (from 164.59 ± 31.42 to 189.26 ± 33.24) significantly increased after blood exchange therapy, P < 0.05.

Summary/Conclusions: Exchange transfusion therapy is an effective way to treat HDN.

P-498
EXCHANGE TRANSFUSION THERAPY IN TREATMENT OF SEVERE HEMOLYTIC DISEASE OF THE NEWBORN (HDN) AND RESULT ANALYSIS
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Background: Hemolytic disease of the fetus and newborns (HDFN) are severe dis-eases, resulting from maternal red cell (RBC) alloantibodies directed against fetal RBCs. The incidence of hemolytic disease of newborns is very low in the Rh system. But the consequences are very serious and lead to miscarriage and newborns are liable to neonatal jaundice, edema neonatorium, anemia, kernicterus and even death.

Aims: To retrospectively analyze the relationship among Rh antibody types, titters and Rh hemolytic diseases of newborns (Rh-HDN) in Taiyuan area.

Methods: The samples of hemolytic disease in Rh system of whom purpera had multiple pregnancies and no transfusion history and neonates had neonatal jaundice within 24 h were collected from January to June 2017 in Taiyuan area. A series of tests were performed, including ABO, Rh blood group tests, irregular antibody screening and identification and cross-matching tests.

Results: For the ten cases, the results were five cases of anti-D, three cases of anti-E, one case of anti-Ce, one case of anti-eC. There were three cases of postnatal or exchange transfusion (IgG antibody titers<1024). Hemoglobin increased significantly after transfusion. None of the others received blood transfusions or the families disagreed with blood transfusions. Four cases had unexpressed hemolysis at birth (the titters ≤16). After blue light therapy, all of the total bilirubins were significantly lower. The duration of hospital stay was 3–24 days.

Summary/Conclusions: In the ten cases, HDN could be caused by the presence of antibodies of Rh blood group in pregnant women, including anti-D, anti-E, anti-eC and anti-Ce. Rh hemolytic diseases of the newborns (Rh-HDN) were independent of different types of antibody and antibody titer.

P-499
DESCRIPTION OF 10 CASES OF HDN CAUSED BY RH BLOOD GROUP ANTIBODY
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Background: Hemolytic diseases of the fetus and newborns (HDFN) are severe dis-eases, resulting from maternal red cell (RBC) alloantibodies directed against fetal RBCs. The incidence of hemolytic disease of newborns is very low in the Rh system. But the consequences are very serious and lead to miscarriage and newborns are liable to neonatal jaundice, edema neonatorium, anemia, kernicterus and even death.

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Summary/Conclusions: In the ten cases, HDN could be caused by the presence of antibodies of Rh blood group in pregnant women, including anti-D, anti-E, anti-eC and anti-Ce. Rh hemolytic diseases of the newborns (Rh-HDN) were independent of different types of antibody and antibody titer.

P-501
CASCADE PLASMAPHERESIS FOR DESENSITIZATION IN ABO INCOMPATIBLE LIVER TRANSPLANT: A COMPARISON OF COBE SPECTRA AND SPECTRA OPTIA
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Background: The reduction of anti-A/anti-B antibodies titters to a safe level is essential pre-requisite for patients awaiting ABO incompatible (ABOi) liver trans-plantation (LT). In order to reduce the antibody titers, currently used therapeutic apheresis (TA) techniques are conventional plasmapheresis, cascade plasmapheresis (CP) and antigen-specific immunoadsorption. We used CP as the technique of choice. The Spectra Optia is a new continuous-flow centrifugal apheresis system developed by Terumo which is based on the COBE Spectra platform.

Aims: To compare the efficiency of Cobe Spectra vs Spectra Optia for CP for desen-sitization in ABOi LT recipients.

Methods: This retrospective observational study included CP procedures performed for desensitization for 4 ABOi LT recipients. CP procedures on the first two patients were done using the COBE Spectra machine and on the next two patients, were done using Spectra OPTIA. Desensitization protocol included Rituximab (dose-100 mg), given 21 days prior to stipulated day of the transplantation. CP/non-selective TA was performed daily/alternative day with daily estimation of antibody titters until the target titter of 8 or less was achieved.

Results: In all patients, antibody titers were lowered to a level below 1:8 by two to six CP sessions before LD (living donor) LT. Cobe Spectra had no secondary plasma device (SPD) program so manipulations had to be done, leading to an extensive circuit which increased the extracorporeal volume (ECV) and lead to hemodynamic instability. The Spectra Optia has a SPD program and also pressure monitoring for the same leading to a smaller circuit, less ECV and better control of the procedure. The mean time in minutes/plasma volume exchanged was 167.5 min for Cobe and 100.5 min for Optia. We also used a flow regulator (B Braun) to regulate waste fluid which improved control over the percentage waste fluid generated.

In initial procedures, when the antibody titers were high, CP led to decrease in anti-body titers by a factor of 2 doubling dilutions. At lower titers (<1:32) CP was less effective and there was resistance to further lowering of titters and conventional TPE was more effective in further reducing titters. Long-term titter levels remained stable in all transplanted patients.

Summary/Conclusions: In our limited experience doing CP procedures on Optia increased the efficiency and ease of doing the procedures with better hemodynamic stability. The use of cascade plasmapheresis is safe and effective for desensitization in ABOi LT recipients.

P-502
SUCCESSFUL LYMPHOPLASMAPHERESIS IN A CHILD WITH MACROPHAGE ACTIVATION SYNDROME: A CASE REPORT AND LITERATURE REVIEW
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Background: Macrophage activation syndrome (MAS) is a severe and life-threaten-ing complication of rheumatic disorders, associated with high mortality rates. Tradi-tionally, the treatment of MAS includes immunoglobulin, cyclosporine, cyclophosphamide, etoposide and plasma exchange. However, these managements are largely empiric and have provided conflicting results, there is great need for new and specific therapies for this condition. To our knowledge, no data are available concerning the use of lymphoplasmapheresis (LPE) in the treatment of MAS.

Aims: To investigate an effective method to save severe MAS patients’ life and cre-ate a platform for medical therapy.

Methods: 1 A 13-year-old boy was admitted to Xiangya hospital on account of high fever for eleven days. On the twelfth day after admission, the patient became life-threatening, with the rapid development of multi-organ failure, acute hemorrhagic and neurologic abnormality, which required the admission of the patient to the...

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intensive care unit (ICU). Laboratory findings were: abnormal liver enzymes, increased myocardial enzyme and ferritin levels (>10000 μg/l), while the patient’s heart rate was 45 beats/min. He was diagnosed of MAS and treated with methylprednisolone, cyclosporine, etoposide and plasma exchange. However, the child was still critical, as clinical symptoms and several laboratory findings were not improved. The COBE Spectra blood cell separator was used for blood components separation. Adjusting the parameter by the manual procedure, we combined the immune active cells removing with plasma exchange in LPE, therefore we could remove pathological plasma composition and activated macrophagocytes, at the same time we could selectively remove different immune active cells.

Results: We performed a LPE: 1,237 ml of the patient’s plasma was removed and replaced with 1,300 ml of frozen plasma, representing an exchange of 39.6% of the patient’s total blood volume (approximately 3,127 ml). The LPE treatment was considered successful as no evidence of transfusion reaction or citrate toxicity was observed. Rapid decrease of lymphocyte and monocytes to normal levels were observed after the LPE. The patient showed a dramatic clinical improvement after the LPE and was discharged from the hospital with walking by himself.

Summary/Conclusions: In cases of MAS, prompt institution of LPE can be effective and life-saving. LPE is an innovative treatment that has been used to successfully treat patients of autoimmune diseases, it has also saved a number of extremely severe patients’ lives. Future therapeutic protocols for the treatment of MAS can potentially include a combination of LPE.

P-504
LYMPHOPLASMAPHERESIS IN THE TREATMENT OF THROMBOTIC THROMBOCYTOPENIC PURPURA
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Background: Thrombotic thrombocytopenic purpura (TTP) is caused by deficiency of ADAMTS13. Despite major progress in recent years in our understanding of the disease, many aspects around the pathophysiology of TTP are still unclear. Acquired thrombotic thrombocytopenic purpura (aTTP) characterized by low ADAMTS13 activity and the presence of anti-ADAMTS13 lgG antibodies. B lymphocytes [CD20] decreased during rituximab treatment has showed potential benefits for patients with aTTP. aTTP is mainly caused by an autoimmune mechanism. Plasma exchange (PE) plus corticosteroids as standard therapy has greatly reduced the mortality of TTP. However, abundant plasma is unavailable in most medical centers in China. Lymphoplasmapheresis (LPE) combined PE and lymphocyte apheresis, in addition to remove autoimmune antibody and B lymphocytes, most of the schistocytes and VWF–platelet aggregates are removed simultaneously.

Aims: To investigate the efficacy and safety of PE in the treatment of aTTP.

Methods: Retrospective study of 12 aTTP patients received LPE plus corticosteroids. Platelet count, lactate dehydrogenase (LDH) level, hemoglobin, schistocytes, ADAMTS13 activity and its inhibitors were monitored. The number of LPE and total plasma volume, remission time and adverse effects were recorded.

Results: The median number of LPE was 4 (2–10) and median total plasma volume was 108.32 ml/kg (55.45–255.86 ml/kg). The median time of initial response of platelet was 3 days (2–6 days), and clinically kept increasing at a median time of 8 days (2–43 days). Severe adverse effects were not occurred during LPE therapy.

Summary/Conclusions: LPE may be more effective and safer than PE in the treatment of aTTP, especially for the severe hemolysis patients. However, randomized controlled trials are required in the further research.

P-505
EFFECTS OF ADVERSE REACTIONS ON IMMEDIATE EFFECTS OF ARTIFICIAL LIVER THERAPY
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Background: The adverse effects of PE and MARS treatment, and the immediate effects of adverse effects on the outcome of the treatment are unclear.

Aims: To investigate the occurrence of adverse reactions in plasma exchange and molecular adsorbent recirculating system and their immediate effects on treatment.

Methods: 87 hospitalization patients with severe viral hepatitis received artificial liver treatment from July 2014 to November 2015 were divided into the plasma exchange group and MARS group, each group were divided into adverse-reaction group and no adverse-reaction group, according to whether adverse reactions occurred or not. Record the occurrence of adverse reactions during the treatment, and the test results before and after artificial liver.

Results: 1. Plasma exchange and MARS could effectively reduce the levels of ALT, TBL, DBIL, Cr, Hb, PLT, and RBC; the ability of plasma exchange to reduce bilirubin concentration was higher than that of MARS, while the removal ability of creatinine was lower than that of MARS. 2. The rate of adverse reaction was 53% in the artificial liver, and plasma exchange had higher rate than MARS [61.43% vs 40.43%;] the highest adverse reaction was hypocalcemia in the plasma exchange group and blood pressure response in the MARS group. 3. The incidence of adverse reactions was related to the type of treatment (plasma exchange or MARS), Ca2+ concentration and red blood cell count before treatment, and adverse reactions had effects on the changes of TBL, DBIL, Cr, K+ and WBC before and after treatment.

Summary/Conclusions: The artificial liver process is prone to adverse reactions, and adverse reactions have effects on the changes of TBL, DBIL, Cr, K+ and WBC values before and after treatment.

P-506
EVALUATION OF ADVERSE TRANSFUSION EVENTS BY WHOLE BLOOD AND BY APERHEESIS IN PEDIATRIC PATIENTS
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Background: In children the incidence of adverse transfusion reactions is higher than in adults patients. In this respect, blood collection and blood preparation have to be continuously improved to reduce the risk of transfusion related to adverse events especially in these patients.

Aims: The aim of this study was to assess the occurrence of adverse transfusion reactions of hemocomponents by whole blood and by apheresis in pediatric patients.

Methods: Between 2011 and 2015, n = 214 pediatric patients were transfused with hemocomponents obtained by whole blood and by apheresis collected from U.O.C. Division of Clinical Immunology, Immunohaematology and Transfusion Medicine of Università degli Studi della Campania “Luigi Vanvitelli”. Adverse event was described as minor allergic reaction, febrile episodes, vomiting, or presence of dyspnea and bronchosapm. Comparison between transfused components and presence/absence of adverse event were assessed using Pearson’s chi-square test.

Results: Data from pediatric patients (n = 144 onco-hematologic and n = 70 thalassemic patients) were analyzed. Male gender was 56% [60% and 46% respectively in onco-hematologic and thalassemic patients], mean age was 12.0 ± 9.9 years (8.5 ± 5.3 and 19.4 ± 12.8, respectively in onco-hematologic and thalassemic patients). Median time of observation was 0.50 years (interquartile range [IQR] 0.11–0.83) in onco-hematologic patients, and 4.9 years [IQR 3.2–4.9] in thalassemic patients. In that period, 12,531 units of hemocomponents were transfused (2,662 in onco-hematologic and 9,869 in thalassemic patients). No difference in proportions of adverse events between whole blood and apheresis was observed (0.3% in whole blood and 0.3% in apheresis, P-value chisquared test = 0.49) and thalassemic patients (0.2% in whole blood and 0.3% in apheresis, P-value chi-squared test = 0.97).

Summary/Conclusions: No difference in post-transfusion adverse events related to whole blood and apheresis both in onco-hematologic and thalassemic pediatric patients was observed. All blood components have shown the same transfusion safety in pediatric patients.
P-507
IDENTIFICATION OF KEY GENES AND PATHWAYS IN PLATELETS OF GLIOMA PATIENT BY BIOINFORMATICS ANALYSIS
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Background: Platelet is an ideal screening object in the diagnosis of some disease, because it is easily isolated and nucleic acid which makes it more simple than nucleated cells in nuclear acids, besides, platelet contains additional nuclear acids by acquiring vesicles secreted by other cells such as tumor cell.

Aims: To find the differentially expressed genes and related pathways in glioma patient’s platelets vs healthy controls.

Methods: We downloaded gene expression profiles of GSE11095 from GEO database. The GSE11095 dataset contains 20 platelet samples, including 12 healthy controls and 8 glioma patients. The differentially expressed genes (DEGs) between the two groups were analyzed by GEO2R online tool, then the gene ontology (GO) and Kyoto Encyclopedia of Genes and Genomes pathway (KEGG) enrichment analyses were performed with DAVID database and KOBAS3.0 software respectively, and protein–protein interaction (PPI) network of the DEGs was constructed by Cytoscape software.

Results: Totally, we identified 174 DEGs in glioma patient’s platelets, including 153 down-regulated genes and 21 up-regulated genes. GO analysis results showed that DEGs were significantly enriched in biological processes (BP), including signal transduction, cell cycle, and the pseudogene 2DP1 (99%), whereas the frequencies of KIR2DS2, 2DS3, and 2DS4, 2DS5, and 3DS1) and the pseudogene 2DP1, 3DP1. KIR2DS4 alleles were also found in one to six individuals. The frequency of genotype 1 was less than 2%.

Summary/Conclusions: Taken above, we have identified DEGs candidate genes and pathways in glioma patients’ platelets with integrated bioinformatics analysis, the results offer some indications for our understanding about the platelet change in glioma patients, and these candidate genes and pathways may be used in the diagnosis of glioma in the future.

P-508
THE DIVERSITY OF KIR IN KOREAN ETHNIC GROUP OF CHINA
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Background: Killer cells immunoglobulin-like receptors (KIRs) are a family of inhibitory and activating receptors expressed mainly by natural killer (NK) cells and few subsets of T lymphocytes. KIRs are a major class of the receptors and recognize groups of HLA class I alleles (KIR ligands). The KIR locus maps on chromosome 19q13.4 within the leukocyte receptor complex (LRC) and comprises a family of polymorphic and highly homologous genes that are tandemly arrayed over about 150 kb. To our best knowledge, no analogous study on the Northeast of Korea ethnic group KIR Polymorphism has been performed so far.

Aims: This study describes the frequency distribution of 16 variable KIR genes in Korean ethnic group of China.

Methods: Genomic DNA from 202 unrelated blood donors from JiLin Province of China were included in this study. Genomic DNA was isolated from 5 ml of blood using the TIANamp Blood DNA kit (Tiangen).Polymerase chain reaction-sequence-specific primer (PCR-SSP) was performed to amplify the genomic DNA for presence or absence of 12 KIR genes (2DL1, 2DL2, 2DL3, 2DS1, 2DS2, 2DS3, 2DS4, 2DS5, and 3DS1) and the pseudogene 2DP1, 3DP1. KIR2DS4 alleles were also typed as being either full length or having the 22-bp deletion that prevents cell surface expression. Two pairs of primers were used for each gene, selected to give relatively short amplicons of 100–800 bp, as previously described in full detail.

Results: In our study, twenty-nine different genotypes were observed and all 16 KIR genes 16 KIR genes were detected among the Korean ethnic individuals. Framework genes KIR2DL3, KIR2DL4, KIR2DL2 and the pseudogene KIR3D1 were present in all individuals. The most frequent non-framework KIR genes detected in the Korean ethnic group were: KIR2DL1 (99%), KIR2DL3 (77%), KIR3DL1 (94%), KIR3DS1 (94%) and the pseudogene 2DP1 (99%), whereas the frequencies of KIR2DS2, 2DS3, and 2DS4 were all less than 20%. The frequency of KIR2DS1, KIR2DL2 and KIR3DS1 was higher than Chinese Han populations (47% vs 33%, 42% vs 33%, 38% vs 29%). The most complex genotype no. 6 represented all 16 KIR genes. Among these genotypes, 46% of the individuals displayed genotype 1 (N = 87), but the other genotypes were only found in one to six individuals. The frequency of genotype 1 was less than other ethnic groups (42% vs 6%).

The group B haplotype occurred more frequently than the group A haplotype. B haplotypes outnumbered A haplotypes in frequency by approximately 1.3:1 (87 A haplotypes vs 115 B haplotypes), which was not similar to that observed in other Chinese Han populations.

Summary/Conclusions: The comparison of KIR frequencies between Korean ethnic group and a local Han population showed that the two populations showed similar frequencies for the most KIR genes. In contrast, the distribution of KIR haplotypes showed significant differences between them.

P-509
MICA POLYMORPHISM AND LINKAGE DISEQUILIBRIUM ANALYSIS WITH HLA-B IN SHENZHEN HAN POPULATION
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Background: On one hand, a large number of studies and clinical trials have shown that, while taking into account the classic HLA matching, if the MICA gene also matched, the receptor’s survival rate would be significantly improve after organ transplantation. On the other hand, the occurrence of post-transplant rejection has a clear correlation with serum MICA antibody in transplantation patients. Furthermore, in the population genetics, the distribution of MICA and HLA-B genes is related to the factors such as geographical and racial factors. So far, the data of MICA polymorphism of Han population in Shenzhen has not been reported.

Aims: To study the distribution characteristics of MICA in the blood donation population of Han nationality in Shenzhen and to analyze its linkage disequilibrium relationship with HLA-B gene.

Methods: The MICA and HLA-B genes were identified by PCR-SBT method in 143 randomly selected Han donors in Shenzhen, whilst the allele frequency, haplotype diversity and linkage disequilibrium parameters were analyzed by Pypop statistical software.

Results: We found 13 MICA and 35 HLA-B alleles in 143 blood donors, in which demonstrate that MICA * 008: 0167/286 and HLA-B * 40: 01 (33/286) was the highest frequency, whilst MICA * 008: 01: HLA-B * 40: 01 (47/286) and MICA * 010: HLA-B * 46: 01 (46/286) are the most common haplotypes. We found 66 MICA-HLA-B haplotypes in total, among which there were 18 common haplotypes (MICA008:01-HLA-B*40:01, MICA010:HLA-B*46:01, MICA002:01-HLA-B*58:01, MICA045:HLA-B*13:01, MICA019:HLA-B*15:02, MICA009:01-HLA-B*51:01, MICA010:HLA-B*15:01, MICA002:01-HLA-B*38:02, MICA008:01-HLA-B*13:02, MICA012:01-HLA-B*54:01, MICA019:HLA-B*37:04, MICA009:01-HLA-B*51:02, MICA010:HLA-B*15:11, MICA018:HLA-B*40:01, MICA008:01-HLA-B*46:01, MICA008:01-HLA-B*38:02, MICA008:01-HLA-B*37:01, MICA010:HLA-B*48:01) and their frequency were all higher than 1%. After P value correction, it showed that these 18 MICA-HLA-B haplotypes had significant linkage disequilibrium in the population. No novel allele was found.

Summary/Conclusions: The presented allele frequencies, haplotype diversities and linkage disequilibrium parameters at high-resolution level in Shenzhen Han population can provide more insights into the studies and applications associated with MICA and HLA-B genes.

P-510
DISTRIBUTION OF HLA-A, -B, AND -DRB1 ALLELE AND HAPLOTYPE AT HIGH RESOLUTION IN THE GUANGXI HAN POPULATION
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Background: The human leukocyte antigen (HLA) genes are the most polymorphic genes in the human genome. To date, May 2016, total of 15 020 HLA alleles have been identified according to the IMGT/HLA Database [release Version 3.23.0] (1). HLA has been found to be critical for infections resistance, autoimmune disease susceptibility, tumour resistance and immune responses to the allograft after solid organ or haematopoietic stem cell transplantation (HSCT) [2, 3]. HSCT is a curative therapeutic method for blood malignancies and other blood disorders.

To 31th July 2016, China Marrow Donor Program (CMDP) has enlisted 2.2 million therapeutic method for blood malignancies and other blood disorders.
donations, including 240 patients beyond mainland China. No doubt, a better and precise characterization of HLA genotypes will improve CDM and benefits transplant recipients.

Aims: This study designed to analyze the distribution feature of allelic and haplo-
typic polymorphisms of human leukocyte antigens at A, B and DRB1 loci in Guangxi Han population.

Methods: A total of 1644 unrelated Han ethnic individual from Guangxi regions were genotyped by polymerase chain reaction-sequence based typing (PCR-SBT) for HLA-A, B and DRB1 loci. Allelic and haplotypic frequencies were estimated by maximum likelihood estimation method using Arlequin software 3.5.2.2, this software was also used to estimate linkage disequilibrium (LD). Phylogeny tree was constructed using the neighbour-joining (NJ) method with the standard genetic distances using the MEGA software 6.0. Departures from Hardy-Weinberg expectations are observed for all three loci in this population.

Results: A total of 37 HLA-A, 70 HLA-B and 37 HLA-DRB1 alleles were detected in 1644 samples. The most frequent alleles were A*11:01(28.86%), B*46:01(14.26%) and DRB1*15:01(13.39%). The most common three loci haplotype was A*33:03-B*58:01-DRB1*03:01 (1.12%). A*02:07-B*46:01, A*11:01-DRB1*15:01 and B*58:01-DRB1*03:01 showed the strongest linkage disequilibrium. The phylogenetic tree analysis suggested that Guangxi Han population had a relative close genetic relationship with Guangxi Zhuang population and were genetically similar to southern Chinese populations.

Summary/Conclusions: We found that the HLA-A, B and DRB1 loci are highly polymorphic in Guangxi Han population, which will be useful for estimating the probability of HLA matching in transplantation as well as for the study of the forensi-

P.511
ALLOIMMUNIZATION AMONG THALASSEMA PATIENTS AT DR. CIPTOMANGUNKUSUMO HOSPITAL (RSCM)-JAKARTA, INDONESIA

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Background: Thalassemia is the most common blood genetic disorder worldwide. In Indonesia the fourth most populous countries in the world with 250 million people, approximately 0–9% β-Thalassemia carriers and 0–40% Hb AE among populations throughout the country potentially contribute around 50,000 β-Thalassemia and Thalassemia/HbE patients requiring blood transfusion per year. Despite the current technology and quality control practice, the availability and safety of blood transfu-
sion is a matter of conjecture. Recent evidence that rare RBCs’ antibodies were detected in multiple transfused thalassemia patients would become somewhat growing concern in clinical transfusion practice.

Aims: To study the occurrence of RBCs alloimmunization among multiple transfused thalassemia patients and identify blood group antibodies potentially developed and induce antigen-antibody reaction affecting patients.

Study was carried out in 88 multi-transfused patients registered with β-thalassemia registered at Dr. Cipto Mangunkusumo Hospital-Jakarta. Patients’ medical record were used for individual data information included the history of transfusion. Antibody screening and identification was tested using Capture R Ready Screen 3 cell and in case positivity using Capture R Ready ID with 14 cell panels (Immucor Inc. Norcross, GA) respectively.

Methods: Study was carried out in 88 multi-transfused patients recorded with β-thalassemia registered at Dr. Cipto Mangunkusumo Hospital-Jakarta. Patients’ medici-

Evidence Based Transfusion Medicine Practice

P.512
LEVELS OF SERUM HEPCIDIN IN SICKLE CELL DISEASE SUBJECTS WITH MULTIPLE BLOOD TRANSFUSIONS

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Background: No effective physiological mechanism for excess iron excretion is known in humans. The predominant negative regulator of iron absorption in the small intestine and iron release from macrophages was recently discovered to be hepcidin which is a 25-amino acid peptide produced by hepatocytes. Conditions such as the sickle cell disease (SCD), where transfusions are frequently reduced or, can subsequently enhance accumulation and circulation of excessogenous iron as non-transferrin bound iron (NTBI) in tissues.

Aims: The present study is aimed at determining the alterations in serum hepcidin levels and red cell indices in sickle cell patients with multiple blood transfusions and any associations between hepcidin and degree of severity of sickle cell anemia.

Methods: The study was conducted on 150 subjects comprising of 50 sickle cell patients (SCD) in stable state, 50 SCD with vaso-occlusive crisis and 50 apparently healthy individuals with HbAA as control who were age, sex and socioeconomic standard matched. Complete blood count, hemoglobin electrophoresis and serum levels of hepcidin were performed on recruited subjects appropriately. The degree of severity (mild, moderate or severe) was determined using a scoring system incorpor-
ating annual number of blood transfusions, crisis episodes and presence of anemia, vaso-occlusive pain and organ complications.

Results: Mean serum hepcidin level was significantly higher in crisis and steady state sickle cell subjects than in controls (P < 0.001). Hepcidin level was found to be increasing with increasing severity of anemia in sickle cell disease subjects. The mean red cell indices showed negative correlation with serum hepcidin level in the sickle cell subjects. Irrespective of the gender, mean serum hepcidin level was higher in Hb-SS subjects with multiple transfusions than control groups (P < 0.001).

Summary/Conclusions: In this study, we observed that serum hepcidin levels were higher in Hb-SS subjects with multiple blood transfusions than individuals with Hb-

P.513
15 YEARS EXPERIENCE OF A COLLABORATIVE PROGRAM TO IMPROVE BLOOD MANAGEMENT PRACTICES IN AUSTRALIA

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Background: Blood collected in Australia comes from voluntary, unpaid blood donors; and, is provided to the patient at no charge. Collaboration of national and
local state governments stakeholders is essential to enhance best practice in patient blood management (PBM), and the stewardship of a precious resource.

Aims: To describe the collaborative approaches used by the Blood Matters Program since 2002, to improve health service outcomes, including meeting national standards and guidelines in Victoria, Australia. Blood Matters is a collaboration between the Victorian Department of Health and Human Services, and the Australian Red Cross Blood Service.

Methods:
- Developing strategies that optimize appropriate product use, and person-centered care, using governance frameworks and standards
- Fostering and strengthening partnerships and stakeholder relationships promoting best practice
- Analyzing data and disseminating findings across the sector to raise awareness, influence practice, promote efficiencies, and provide value
- Providing and promoting expert knowledge sharing and collaboration across the sector, including specific initiatives, tools and specialized advice

Results: With over 15 years in the local blood sector, Blood Matters is recognized as a leader in improving blood management:
- Establishment of Transfusion Nurses, Trainers & Safety Quality Officers roles across 41 health services, who now systematically improve transfusion practice and sustain change in their respective health services.
- Over 150 successful graduates of the Graduate Certificate in Transfusion Practice, creating a wealth of highly skilled blood experts across the health system
- More than 1,700 incidents reported and analysed in the voluntary haemovigilance system (Serious Transfusion Incident Reporting), allowing strategies and recommen-
dations to be made to improve the overall safety of the transfusion process
- Reduction of Victorian red blood cell wastage and meeting national targets; with Victorian red cell wastage rate sitting below national average for the first time in April 2016
- Increased communication between the Blood Service, health services, jurisdictions and government agencies
- Support three additional jurisdictions to improve PBM through haemovigilance reporting, supporting transfusion nurses and practice audits

Summary/Conclusions: With a small financial investment and a focus on collaboration, are essential to continue to enhance best practice in PBM and improve stewardship of blood.

P-514 DEVELOPMENT AND CLINICAL APPLICATION OF PRECISION BLOOD TRANSFUSION MANAGEMENT SOFTWARE

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Background: The rationality and accuracy of blood transfusion is a difficult problem in clinical practice. Inappropriate transfusions waste valuable blood resources and disadvantageous situation of the clinical transfusion management is expected to be reversed.

Aims: To develop management software that fulfills to precise transfusion and applies it to clinical practice so as to promote rational use of blood.

Methods: According to the guideline of blood transfusion and logical function formula of transfusion theory, the blood transfusion management software was developed to give specific functionality including the audit for pre-transfusion indications. Meanwhile, the software can run automatic calculation by given some parameters and generates a recommended transfusion value of red blood cell, hemoglobin, plasma, cryoprecipitate and platelet for different individuals. In addition, it can conduct the evaluation of curative effect on erythrocyte and platelet transfusion.

Results: Blood Precision Transfusion Management Software was successfully developed. Preliminary application results show that, the appropriateness of blood transfusion including blood transfusion indications and transfusion amount has achieved significant improvement compared with the data before use this software (2/80 vs 15/80, P < 0.05). In addition, there was a significant decrease in the average blood transfusion amount per inpatient and the average blood transfusion amount per operation (P < 0.05).

Summary/Conclusions: The Blood Precision Transfusion Management Software can significantly improve the rationality of clinical blood transfusion, and perform more accurate and effective blood transfusion and save blood resources. It is worthy of further popularization in clinical practice in future.

P-515 CLINICAL APPLICATION OF PLATELET MISMATCHING IN PATIENTS UNDERGOING SURGICAL TREATMENT

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Background: Platelet matching is an effective strategy in the treatment of ineffective platelet transfusion. It has been shown that platelet matching can improve the transfusion efficiency significantly in patients with hematologic diseases or cancer. Our researches focus on the patients who undergoing surgery which intraoperative massive blood transfusion including liver transplantation or valve replacement and who platelet transfusion is needed postoperative, to investigate the positive rate of platelet antibody and the effect of platelet matching in these patients, and to provide clinical evidence for finding effective ways to improve effective rate of platelet transfusion in these patients.

Aims: To explore the effect of clinical application of platelets match in patients who need platelet transfusion after surgery.

Methods: Randomly select 45 patients who need platelet transfusion after surgery in our hospital in 2017 as experimental group, and adopt Solid-phase agglutination test to undertake platelet antibody screening as well as platelet matching test, and infuse the matched platelets. Meanwhile select 45 patients who need platelet transfusion after the same surgery as control group and infuse random platelets. The effect of platelet infusions of two groups is evaluated by 24 h corrected count increment (CCI), and compare the efficiency of platelet transfusion between the two groups to evaluate the clinical effect of platelet matching in surgical patients.

Results: The positive rate of 45 patients’ platelet antibody screening in experimental group is 53.3% (24/45), and 24 h CCI in experimental group is 12.7 ± 1.9; while in control group 24 h CCI is 7.0 ± 1.5. The difference between the two groups is statistically significant (P < 0.05). In experimental group, the effective rate of matched platelet transfusion is 71.1% (32/45), while in control group the effective rate of random platelet transfusion is 44.4% (20/45). The difference between the two group is statistical significance (2 × 6.6, P < 0.05).

Summary/Conclusions: Surgical patients are likely to produce platelet antibodies due to intraoperative infusion of blood products, and platelet matching could improve the effective rate of platelet transfusion.

P-516 PATTERNS IN BLOOD PRODUCT UTILISATION IN ORTHOTOPIC LIVER TRANSPLANTATION IN A TERTIARY HOSPITAL

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Background: Transfusion requirements in orthotopic liver transplantation (OLT) have reduced dramatically over the last two decades. Minimising bleeding and reducing unnecessary transfusions are key goals in the perioperative period. Advances in surgical and anaesthetic techniques including point of care testing have all contributed to a decline in allogeneic blood product use. There are limited studies that have shown a change in use of blood and blood products in OLT patients.

Aims: The aim of the study was to examine the changing trends in blood product use in orthotopic liver transplantation (OLT) patients over the years.

Methods: A retrospective study of patients undergoing OLT at Flinders Medical Centre between 2003 and 2014 was conducted. Over the 12 year period there was no change in number of male patients or patient’s age or MELD score. OLT patient details were extracted from the liver transplant database, patient demographics and morbidity from the hospital database and blood product use from the transfusion laboratory information system.

Results: While there was no change in RBC transfusion rates, a high proportion (80%) of OLT patients received FFP at the start of the study period compared to only 28% in 2014 (P < 0.001) with a significant fall in the number of FFP units transfused from a median of 4 (IQR 2-5) in 2003 to 0 (0-1.5) in 2014 (P < 0.001). There was negligible use of cryoprecipitate before 2003 and 2007. However, the median dose of cryoprecipitate gradually increased to reach a peak in 2012, median of 4 doses (IQR 1.5-7) and subsequently dropped to a median of 2 doses in 2014 (P < 0.001).

The proportion of patients receiving platelets initially started to increase from 2006 (69.2% of patients) and peaked in 2010 (85%) and remained stable until 2013 followed by a drop in 2014 (50%) (P = 0.008). The median volume of intraoperatively scavenged RBC reinfused in 2014 was 477 ml (340-736 ml) compared to a median of 1310 ml (778–2855 ml) in 2003 (P < 0.001).
Aims: and it allows the effective monitoring of haemostatic treatment in real time. It is Thromboelastometry (TEM) performed on the Rotational thromboelastometry (ROTEM) system, an enhancement of the traditional thromboelastograph (TEG) method. The rapid assessment of coagulation is the main advantage of ROTEM and it allows the effective monitoring of haemostatic treatment in real time. It is important to assess the effectiveness of this point of care testing in blood and blood component therapy, for timely treatment of patients with acute need of blood.

Methods: A descriptive retrospective study was carried out in blood bank of National Hospital of Sri Lanka (NHSL) during six months (July 2015 to January 2016) period.

Results: During the period of this study Blood bank of NHSL received 667 ROTEM samples for analysis. Samples were sent from Neuro trauma/surgery, Cardiothoracic, intensive care units, operation theatres, medical and surgical wards. Most of the samples (80.6%) were sent from Neurotrauma/ surgical, cardiothoracic and surgical ICUs and they were 59.2%, 11.9% and 9.9% respectively. ROTEM investigations are usually carried out for the management of patients with brain hemorrhage, post operative bleeding and active bleeding after trauma. 81% of the samples received had normal findings. Among the abnormal samples, abnormalities were corrected with the blood and blood components prescribed according to ROTEM results, in 97% of cases. Samples were sent to assess the coagulation problems of patients but most of patients had no indication for blood component therapy according to ROTEM results. In 2015 total FFP and Cryoprecipitate usage have decreased but platelet, Cryoprecipitate and RCC usage have increased compared to the usage in 2014.

In both Neuro trauma/ surgery units and Cardiac units FFP usage is reduced and there is increased usage of platelet, cryoprecipitate and RCC. There is a significant percentage increase in FFP usage in cardiac surgery units (P < 0.001), but Cryoprecipitate usage has significantly reduced (P < 0.01). In Neuro trauma/ surgery units there is a statistically significant percentage increase seen in platelet usage and changes in other components are not significant.

Summary/Conclusions: Samples for analysis were sent from bleeding patients or patients with bleeding tendency but most had normal finding and blood and blood components were not prescribed, showing proper patient blood management. According to literature, most of the studies have shown that there is a reduction in plasma, cryo and platelet usage after introduction of ROTEM. Even though it has been shown that patient management using ROTEM is cost effective, component usage has increased with introduction of ROTEM testing in our setting. Patient management using ROTEM based algorithms have been implemented in most of the settings and there is reduced component usage after implementation of this new technology. In our setting, it was found that prescription of blood and blood components were done without using proper documented protocols or algorithms. Component usage during the study period showed a change to what observed in previous year. It is recommended to introduce algorithm based management and it should be followed up with an assessment of the cost effectiveness after a reasonable period of time.

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**SEROLOGY APPROACHES TO RESOLVE ABO DISCREPANCY IN A THAI FAMILY**

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Background: ABO blood group system is the most clinically important in transfusion medicine. Not only in acute hemolytic transfusion reactions and hemolytic disease of the fetus and newborn, but in paternity testing as well. The absence of H antigen on red cell membrane and in secretions together with potent anti-H in plasma result in Bombay phenotype which is very rare. In our population, another phenotype called para-Bombay is more common. They have low level of ABH, weak anti-H in plasma and can secrete ABH in secretions. Thus, result in ABO discrepancy which may cause wrong interpretation in paternity testing.

Aims: To demonstrate the serological solving in a Thai family with ABO discrepant results between the baby and the parents.

Methods: A 2-day-old newborn was found to be AB, Rh positive but the father and the mother were B and O, respectively. Due to the discrepant results, blood samples (clotted and EDTA) and saliva of the parents were sent to the Reference Laboratory, National Blood Centre, Thai Red Cross Society in Bangkok for further investigation.

Results: ABO cell grouping of the parents and the baby were performed by conventional tube test (CTT) with anti-A, anti-A1, anti-B, anti-A, B and anti-H. The results confirmed group B of the father and group AB of the baby. Interestingly, the mother's red cells gave negative reaction with all ABO antisera tested. Her plasma gave 4+ reaction with B cells and weak reaction with all panel cells tested at IAT, autocontrol was negative. To solve ABO discrepancy, saliva test was performed which A and H substances were detected. We concluded that the mother was A, para-Bombay with weak anti-H. Therefore, the baby inherited A antigen from the mother and B antigen from the father.

Summary/Conclusions: In order to solve ABO discrepancy, anti-H and anti-A1 should be included in ABO cell grouping using CTT. In addition, saliva test results could help confirm the correct ABO group.

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**ASSESSMENT OF THE EFFECTIVENESS OF POINT OF CARE TESTING (ROTEM) IN BLOOD AND BLOOD COMPONENT THERAPY OF PATIENTS IN NATIONAL HOSPITAL OF SRI LANKA**

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Background: Thromboelastometry (TEM) performed on the Rotational thromboelastometry (ROTEM) system, is an enhancement of the traditional thromboelastography (TEG) method. The rapid assessment of coagulation is the main advantage of ROTEM and it allows the effective monitoring of haemostatic treatment in real time. It is important to assess the effectiveness of this point of care testing in blood and blood component therapy, for timely treatment of patients with acute need of blood.

Aims: Assessment of the effectiveness of point of care testing (ROTEM) in blood and blood component therapy

Methods: A descriptive retrospective study was carried out in blood bank of National Hospital of Sri Lanka (NHSL) during six months (July 2015 to January 2016) period.

Results: During the period of this study Blood bank of NHSL received 667 ROTEM samples for analysis. Samples were sent from Neuro trauma/surgery, Cardiothoracic, intensive care units, operation theatres, medical and surgical wards. Most of the samples (80.6%) were sent from Neurotrauma/ surgical, cardiothoracic and surgical ICUs and they were 59.2%, 11.9% and 9.9% respectively. ROTEM investigations are usually carried out for the management of patients with brain hemorrhage, post operative bleeding and active bleeding after trauma. 81% of the samples received

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P-520
PLATELET TRANSFUSION PRACTICES IN ADULT SURGICAL, HAEMATOLOGY AND ONCOLOGY PATIENTS: A CLINICAL AUDIT

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Background: Platelet transfusions are indicated for the prevention and treatment of hemorrhage in patients with thrombocytopenia or platelet function defects. Platelet transfusion should be judicious and must be given only when there is clear clinical justification in order to reduce risks associated with transfusion, costs from production and possible shortages.

Aims: The aim of the study was to evaluate current practice of platelet transfusions in adult surgical, hematology and oncology patients against standards drawn from the BCSH (British Committee for Standardization in Haematology) guidelines for platelet transfusions. This would help to identify platelet ordering practices of physicians and the areas that need improvement.

Methods: A retrospective analysis of platelet transfusion therapy given to adult surgical, hematology and oncology patients at Aga Khan University Hospital was done in the month of June 2015. Medical charts of all patients who received platelet transfusion during study period were reviewed. The record was evaluated to review primary diagnosis, platelet count and indications for platelet transfusion. Current practice of platelet transfusion were compared against standards drawn from the BCSH.

Results: A total of 141 episodes of platelet transfusion occurred in the service of surgery, hematology and oncology patients. Out of which 72% (n = 101/141) of transfusion occurred in hematology patients, 10% (n = 14/141) in oncology patients and 18% (n = 26/141) in surgical patients. Among hematology and oncology patients the transfusion were mostly done with the prophylactic intent comprising 90% and 71% respectively. Whereas in surgery 73% of transfusion was done for therapeutic purpose. Eighty-nine percent (n = 90/101) of transfusions done in hematology was justifiable as per the BCSH guidelines. In oncology department 71% of transfusion done were rational. Whereas in surgical department only 31% of platelet transfusion were adherent to guidelines. Platelets were transfused in these patients having normal platelet count; but with active bleeding due to other surgical correctable causes.

Summary/Conclusions: The audit demonstrated a high rate of adherence of platelet therapy to BCSH standard in hematology and oncology patients. However the policy was significantly breached in surgical patients indicating an area for intervention in the form of physician’s education to rationalize the use of platelet product.

P-522
SONOCLOT ANALYSIS IN PATIENTS WITH CARDIAC SURGERY AND ITS CORRELATION WITH CONVENTIONAL COAGULATION TESTS

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Background: Sonoclot Analysis in Patients with Cardiac Surgery and Its Correlation It is important to monitor the coagulation status in patients undergoing cardiac surgery. The conventional coagulation tests including prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen concentration (FIB), and platelet count (PLT) are mostly applied in clinical laboratories. The Sonoclot analyzer traces the transition of whole blood, from fluid to viscous clot, with a vibrating probe. Both clotting and late fibrinolytic state can be assessed with variables including activated clotting time (ACT), clot rate (CR), and platelet function (PF).

Methods: The test results of 281 patients with cardiac surgery were reviewed retrospectively. Pearson correlation was performed between Sonoclot variables (ACT, CR, PT, and PF) and conventional variables (PT, APTT, FIB, and PLT), then linear regression model was used to evaluate the association between conventional variables and Sonoclot variables.

Results: There was significant positive correlation between ACT and APTT or TT, the correlation coefficients were 0.623 (P < 0.01) and 0.528 (P < 0.01) respectively, and the regression equations were Y = 1.524X–118.184 and Y = 2.976X+141.336. There was no significant correlation between ACT and PT, or FIB, or PLT. There was significant negative correlation between CR and APTT or TT, the correlation coefficients were -0.415 (P < 0.01) and -0.415 (P < 0.01) respectively, and the regression equations were Y = -0.193X+10.344 and Y = -0.296X–28.164. There was an significant positive correlation between CR and FIB or PLT, the correlation coefficients were 0.449 (P < 0.01) and 0.206 (P < 0.01) respectively, and the regression equations were Y = 8.241X–5.757 and Y = 0.041X–16.376. There was significant negative correlation between CR and APTT, the correlation coefficients were -0.2093 (P > 0.01) and -0.213 (P < 0.01) respectively, and the regression equations were Y = -0.098X+3.185 and Y = -0.010X–2.558. There was significant positive correlation between CR and PT, the correlation coefficients were 0.389 (P < 0.01) and 0.615 (P < 0.01) respectively, and the regression equations were Y = 0.771X+0.608 and Y = 0.013X–0.392.

Summary/Conclusions: There is significant correlation between Sonoclot parameters and conventional coagulation parameters in patients with cardiac surgery.
Aims: To analysis the mutation characteristics of GBA gene in Gaucher disease led to one case of platelet transfusion refractoriness.

Methods: A 38-year-old female patient was diagnosed with anaemia and thrombocytopenia. After she showed platelet transfusion refractoriness, bone marrow smear, β-glucocerebrosidase activity in leukocytes, B-ultrasonography, Sequencing technology and pedigree investigation were performed on the proband and family, β-glucocerebrosidase activity in leukocytes was detected by Dried Blood Spot. DNA of the proband and family was extracted from the peripheral blood and subjected to sequencing using the Sequencing technique.

Results: Pedigree investigation showed that the father, mother, son, daughter and sister of this proband were all heterozygous mutation for the GBA gene. Microscopic findings demonstrated Gaucher cells (accounted for 6.0%) in bone marrow and β-glucocerebrosidase activity in leukocytes was 3.78 nmol/[h·mgPro](lower than normal). Meanwhile B-ultrasonography showed spleen size 6.2 × 25 cm (slightly splenomegaly); Sequencing of GBA genomic and cDNA identified one novel homozygous mutation, c.484A>C (p.Met162Val).

Summary/Conclusions: The patients of Gaucher disease may appear platelet transfusion refractoriness due to the hypersplenism. In addition, the GBA gene mutation had its local characteristics and was the main pathogenic missense mutation, which contributes to Gaucher disease of the family.

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P-529
A MULTICENTER STUDY OF PLASMA AND PLATELET USE IN CHINA BASED ON A SAMPLING OF 24 HOSPITALS
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Background: There are a little information regarding plasma and platelet use in the China, it iseyed to survey data of blood program improvement of plasma and platelet therapy.

Aims: The purpose of this study was to study detailed medical information of plasma and platelet using from Grade 3A hospitals in China and operation to identify patterns of blood use that may be used for blood program planning and transfusion audits.

Methods: A blood utilization survey was performed by collecting detailed medical information from 24 Grade 3A hospitals (tertiary hospital) for all patients transfused with plasma and platelet, one each from the 24 selected provinces in China, from January 1, 2014 to December 31, 2014. A standard data collection form was distributed to the selected hospitals by the coordinating center (Chinese Institute of Blood Transfusion).

Results: The distribution of major clinical departments of plasma clinical application is 42% of surgery, 22% of medicine, 19% of ICU, 10% of haematology and obstetrics, 3% of pediatrics and 3% of other departments; The distribution of major clinical departments of platelet clinical application is 17% of surgery, 48% of medicine, 6% of ICU, 19% of haematology and obstetrics, 6% of pediatrics and 4% of other departments.

Summary/Conclusions: This is the first blood utilization survey performed in China in large scale. This data provided the baseline status of blood use in China; it can be used to guide future epidemiology study as well as clinical trials.

P-530
ANALYSIS OF CURRENT STATUS OF CHRONIC RED BLOOD CELL TRANSFUSION
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Background: Chronic red blood cell (RBC) transfusion is widely practiced as part of supportive care in patients with chronic anaemia. However, there were few reports on the actual situation of that.

Aims: We aimed to study the current status of chronic RBC transfusion.

Methods: Among patients who received RBC transfusions at a regional hospital from January 2011 to December 2015, patients who were consistently transfused with more than 15 units of RBC for more than one year were included. We retrospectively analyzed the status of RBC transfusion, including the laboratory findings related to transfusion using medical records.

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Results: A total of 58 patients were included in the study. The mean age of patients was 66.4 years, and there were 24 hematologic malignancies (41.4%), 20 malignant tumors (34.5%), and 14 chronic diseases (24.1%). The mean hemoglobin level at the beginning of transfusion was 7.0 g/dL, and eight patients (13.8%) showed RBC alloimmunization as the transfusion proceeded. The mean serum ferritin level at the initial phase of transfusion was 475.3 ng/mL and increased to 1,462 ng/mL during the late phase of transfusion.

Summary/Conclusions: Since the number of elderly patients treated with chronic diseases including tumors is expected to increase significantly, patients with chronic transfusions are also expected to increase. It is necessary to research and prepare measures such as establishment of guidelines.

P-532 TO DETERMINE THE EFFECTIVENESS OF ALBUMIN ADMINISTRATION IN BURN INJURIES

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Background: Albumin, a natural colloid, is commonly used for fluid resuscitation and treatment on burn and critically patients due to less anaphylactic reaction and less infection rate compared with fresh frozen plasma (FFP). It decreases “fluid creep”, a phenomenon of using more resuscitation fluid than predicted. Fluid resuscitation is mainly to maintain organ functions and to decrease edema through minimal volume intake. Albumin is an ideal fluid to reach the goal by oncotic pressure and improve hypoproteinemia and supply nutrients, so it is reported to reduce mortality, compartment syndrome and other complications. On the contrary, some studies indicated that the group using albumin as resuscitation fluid in burn patients, and patients with hypoproteinemia has higher mortality rate. Color Dust explosion at Formosa Fun Coast waterpark happened in Taiwan on June 27, 2015, caused 15 deaths and 484 injuries. Large amount of albumin was used for treatment in this devastating event.

Aims: To determine whether albumin use is safe and effective.

Methods: The single variable and multiple Cox proportional hazard models to estimate hazard ratios (HRs) and corresponding 95% confidence intervals (CIs) were performed. The study was used SPSS statistical package.

Results: In univariate analysis, only transfusion of albumin increased length of stay (LOS) (P < 0.05). After adjusting confounding factors such as TBSA%, inhalation injury and blood product transfusion, albumin administration are independent risk factors to increase LOS. The use of albumin decreased the probability of discharge in patients with mild status, including the absence of inhalation injury and acute kidney failure within 5 days admission, meeting < 3 items of ABA sepsis criteria at admission and concurrent involvement of the above 3 conditions. (All P < 0.05).

Summary/Conclusions: Severe burn patients with larger TBSA were reported to have poor prognosis and hypoproteinemia which led to organs dysfunction, so using albumin could increase the probability of discharge in patients with TBSA%. Increasing bronchial circulation induced artificial macus edema and pulmonary transvascular flux of fluid, neutrophils and inflammatory mediators, and then increased reactive oxygen species (ROS) and cell damage following inhalation injury. Albumin can reduce extravascular volume by its oncotic pressure and the level of ROS by its antioxidant properties. Those clarify the therapeutic effects of using albumin significantly in presence of inhalation injury.

Acute renal failure (ARF) mainly is caused by hypoxiaemia state postburn and can be prevented by adequate fluid resuscitation, so the albumin use in the patients without ARF had lower hazard ratio of discharge rate. In addition, the patients meeting count of ABA sepsis criteria < 3 items had lower hazard ratio of discharge rate which is consistent with the result of albumin use in sepsis patients in ALBIOS study and EARSS study and subsequent findings which indicate the use of albumin didn’t increase a survival rate, although hemodynamic improvements are obvious. Sum up, our study not only provides us another aspect that albumin use in burn patients through demonstrating that albumin use in patients with mild status might be detrimental, but also opens up new horizons which in turn lead us to a deeper thinking the indications of albumin in different clinical conditions.

P-533 EFFECTIVITY AND SAFETY OF SMALL DOSE RED BLOOD CELLS TRANSFUSION IN SEVERE HEMOLYTIC ANEMIA PATIENTS

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Background: Severe hemolytic anemia is a disease threaten to human life and health. Transfusion is one of the main therapy. However, large doses of xenogenous red blood cells infused may aggravate hemolysis and kidney damage. Without transfusion, patients may arise serious hypoxia, even multiple organs failure. In our study, we discovered that small dose red blood cells transfusion could improve hemoglobin of the severe hemolytic anemia patients.

Aims: To observe the therapeutic result and safety of severe hemolytic patients infused small dose of homotype red blood cells.

Methods: In the study, we screened the small dose red blood cells (0.5U to 1U) with the same antigen of DEeCc and MNS for these severe hemolytic anemia patients. After blood transfusion, we observed with the variation of hemoglobin, bilirubin and creatinine value in the first day and the third day.

Results: 17 patients were included, which treated with small dose red blood cells in Xiangya Hospital from June, 2014 to June, 2017. The average age was 42.7 years (from 16 years to 69 years). The average hemoglobin, total bilirubin and creatinine of these patients were 34 g/L, 59.1 mmol/l and 111.4 mmol/l before transfusion. After transfusion, the hemoglobin value was increased and the bilirubin values were decreased. The variation had statistical significance (P < 0.05). The alter of creatinine value had no statistical significance (P > 0.05).

Summary/Conclusions: Conclusions: Treated severe hemolytic anemia patients with small dose of red blood cells could improve hemoglobin, and it wasn’t aggravate hemolysis and renal damage. So we deemed it was a safety and effective therapeutic method.

P-534 CLINICAL EFFECTS OF WASHED RED BLOOD CELLS SUSPENDED IN MAP AND NORMAL SALINE

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Background: Normal saline washed red cells are a special component prepared only on demand for patients with antibodies to plasma protein and those who have severe allergic reactions when transfused with blood products. The normal saline washing is done thrice times by manual or automated methods, the final product should be suspended in normal saline or MAP red blood cells storing solution. But it is unclear that clinical effects of washed red blood cells suspended in MAP and normal saline.

Aims: To explore clinical effects of washed red blood cells suspended in MAP and normal saline and to provide theoretical basis for clinical accuracy of blood transfusion.

Methods: Retrospective analysis was performed on 300 patients who were treated with washed red blood cells from 2016.6 to 2016.12. These patients were divided into two groups, one group was infused with washed red blood cells suspended in normal saline (saline group), the other group was infused with washed red blood cells suspended in MAP (MAP group). All patients were infused with 2U correspondingly washed red blood cell products, then Blood Routine Tests were measured before transfusion and 24 h after transfusion. The changes of hemoglobin (Hb) levels were
observed before and after treatment in two groups. At the same time, the adverse reaction of blood transfusion was observed.

Results: After blood transfusion, Hb levels of patients in two groups were improved, and compared with before and after transfusion were statistically difference (P > 0.05). There were no significant differences in the two groups (P > 0.05). There were two patients who had adverse reaction of blood transfusion in MAF group, the other group had adverse reaction of blood transfusion, but the incidence of adverse reactions of blood transfusion was no significantly different between the two groups (P > 0.05).

Summary/Conclusions: Two kinds of washed red blood cells were safe and effective, but for patients with renal dysfunction, the elderly patients with recurrent transfusion of hemolytic anemia, it is suggested that as far as possible to infuse with washed red blood cells suspended in normal saline in 24 h.

P-536

ANALYSIS OF INFLUENTIAL FACTORS OF CLINICAL PROGNOSIS IN TRAUMATIC PATIENTS

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Background: The effect of blood transfusion on the prognosis and prognosis of trauma patients is not clear and needs further study.

Aims: To investigate the prognostic factors of trauma patients by retrospective case-control study on clinical data of trauma patients.

Methods: Retrospective analysis of all the trauma patients' clinical data in the first affiliated hospital of Nanchang university from January 1, 2011 to December 31, 2016, a total of 419 cases were included. According to the units of RBC transfusion within 24 h after admission, the patients were divided into transfusion group and non-transfusion group, and including 265 cases of transfusion group, 154 cases of non-transfusion group. Analyzed and compared two-group patients' clinical data and clinical prognosis indicators, and used Logistic regression analysis to analyze the risk factors related to in-hospital mortality, to explore the influence factors of clinical prognosis of trauma patients.

Results: There was no significant difference in sex, age and cause of injury between the patients with transfusion and non-transfusion (P > 0.05). The 60 days mortality rate, total mortality rate, the rate of nosocomial infection, time of mechanical ventilation, ICU stay and total length of stay in patients with transfusion group were significant higher than those in non-transfusion group (P < 0.05), no adverse reactions of blood transfusion occurred in transfusion group. Univariate logistic regression analysis showed that trauma type, ISS, HR, SBP, Hb, Fbg, INR, RBC and plasma transfusion volume, nosocomial infection, time of mechanical ventilation, ICU stay and total length of stay was the risk factor of in-hospital death in trauma patients (P < 0.05). Multivariate logistic regression analysis showed that trauma type, ISS, HR, SBP, Hb, Fbg, INR, RBC and plasma transfusion volume, nosocomial infection, time of mechanical ventilation, ICU stay and total length of stay was the independent influence factors of in-hospital death in trauma patients (P < 0.05).

Summary/Conclusions: Increased RBC transfusion, open trauma, and prolonged ICU hospital stay were independent risk factors for trauma patients' in-hospital mortality. Traumatic patients with early positive hemostasis, a reasonable blood transfusion can reduce the total blood use, reduce the incidence of complications of patients, improve patient clinical prognosis and reduce patient mortality.

P-537

EXTENSIVE TRANSFUSION OF RH D-POSITIVE BLOOD IN AN "ASIA TYPE" DEL PATIENT

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Background: Among D variants known as DEL, the most common is RHD (1227G>A), which is also referred to as “Asia type DEL”. Transfusions of red blood cells from Asia type DEL donors were reported to induce anti-D alloimmunization. Patients who carry the DEL variant (RHD 1227G>A) have been reported to receive transfusions from RhD-positive donors without the risk of alloimmunization.

Recently, the Korean national transfusion guideline (2016) allowed the transfusion of RhD-positive blood products to Asia type DEL patients when shortage of RhD-negative blood is eminent and in cases of emergency.

Aims: We report our experience of extensive use of RhD-positive blood products in a patient with Asian type DEL blood type

Methods: RhD typing was done with monoclonal-polyclonal blend anti-D (Biocline, clone MAD2, Ortho Clinical Diagnostics, Raritan, Nj, USA) and human IgG/IgM Monoclonal anti-D (Biocline, Millipore, Livingston, UK). Extended phenotyping of Rh was done with monoclonal anti-C (Biocline, Ortho Clinical Diagnostics), -c, -e and -E (Biocline, Ortho Clinical Diagnostics). Genotyping was done by PCR on 4 loci of the RHD gene (promoter, intron 4, exon 7 and exon 10) and direct sequencing on exon 9.

Results: A 29-year-old man was admitted to our hospital with cardiac arrest due to ventricular tachycardia. He was diagnosed with severe heart failure due to left isomerism with complex congenital heart disease. AB0 and RhD blood grouping results were group A and RhD-negative. Extended Rh phenotyping was CDcEcE, and antibody screening test was negative. RhD genotyping confirmed the patient as Asia type DEL (RHD 1227 G>A) variant. On 11 day of admission, transfusion orders was issued due to persistent thrombocytopenia and hemorrhage at the removal site of intravenous central line. Inventoried RhD-negative platelets was short, and one unit of RhD-positive SDP was transfused along with injection of 1,500 IU of Rhogam. Following antibody identification tests showed the presence of anti-D, which converted to negative after 70 days. The patient received heart transplantation and received a total of 37 blood transfusions for 17 days after. Inventory of RhD-negative red blood cells was short, and 4 units of RhD-positive blood were transfused to account for emergencies. Antibody screening and direct coombs tests were persistently negative during our follow up for three months after RhD-positive blood transfusion.

Summary/Conclusions: We have demonstrated that RhD-positive blood can safely be transfused to Asia type DEL patients (1227G>A) without risk of anti-D alloimmunization.

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ELEVATED IMMUNOSUPPRESSIVE ACIDIC PROTEIN CORRELATES WITH HEPATIC ENZYME LEVELS IN PATIENTS RECEIVING ALLOGENIC BLOOD TRANSFUSION

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Background: Allogenic blood transfusions produce generalized immunosuppression in the recipient. Previous reports suggest that transfusion of blood in patients with no known liver diseases produce an increase in transaminases. This may be result from increased vascular permeability due to possible leucocyte antibodies or secondary causes.

Aims: The relationship between the immunosuppressive effect of blood transfusion and liver function enzymes was observed in this study.

Methods: Institutional ethical approval and informed consent of participants was obtained in this cross sectional study. Participants were trauma patients receiving care in a tertiary hospital facility. 5 ml of pre and post transfusion (48 h) blood samples was obtained from consenting subjects into K3 EDTA and Plain sample bottles after the completion of a structured questionnaire. Blood samples were also obtained from units transfused to the subjects. Platelet counts, aspartate aminotransferase (AST), alanine transferase (ALT), alkaline phosphate (ALP), plateletcrit (PCT), platelet distribution width (PDW), mean platelet volume (MPV), Total Protein estimation and Albumin estimation was determined on the samples using standard protocols. Thrombopoietin and Immunosuppressive acidic protein (IAP) was determined by ELISA.

Results: There was a significant rise (P < 0.05) in patients who received transfusion by ELISA.

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increased (P ≤ 0.05) in patients receiving allogeneic blood transfusion. There was no correlation between the number of units received and the levels of the hepatic biomarkers but a strong correlation was observed with the levels of IAP. Summary/Conclusions: The transfusion of allogeneic blood is associated with immunosuppression, which is evidenced by elevated levels of immunosuppressive acidic protein. The rise in levels of post transfusion IAP correlates with hepatic enzyme levels in patients receiving allogeneic blood. This has implications for patients with graft vs host disease or immunodeficiency requiring blood transfusion.

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Abstract has been withdrawn

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HOW DO WE TREAT REFRACTORY CASES OF THROMBOTIC THROMBOCYTOPENIC PURPURA
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Background: Thrombotic Thrombocytopenic Purpura (TTP) is a rare but serious disease condition that can have a high fatality rate if not treated promptly. The characteristic feature associated with TTP is deficiency of von Willebrand factor (vWF) cleaving protein ADAMTS13 (a disintegrin and metalloproteinase, with a thrombospondin type 1 motif, member 13) which in turn activates the thrombotic system causing microvascular thrombi, macroangiopathic haemolytic anemia (MAHA) and organ ischemia. The current protocol for treatment of TTP basically includes intensive plasma exchange with Plasma as a replacement fluid along with immunosuppressant such as steroids, however in few cases, the patients might not show clinical improvement or deteriorate after prolonged plasma exchanges. In such cases, second line of treatment in the form of rituximab can be considered. We present a case who was diagnosed with TTP and was being treated for same with plasma exchanges and steroids, the patient responded well initially and his platelet count rose to 150,000/ul on day 8 however, as soon as the plasma exchange was tapered the platelet count decreased to 40,000/ul on day 10. Aims: To study the treatment protocols to be followed in cases who are refractory to conventional Plasma exchanges. To study the efficiency of Rituximab as a second line of treatment in cases who are refractory to conventional plasma exchanges.

Methods: A 34-year-old male patient presenting with chief complains of pain in abdomen, fever, purpuric rashes and two episodes of loss of consciousness within 24 h was referred to our hospital. On further investigations, Laboratory reports showed anemia and thrombocytopenia and peripheral smear showed schistocytes, suggestive of microangiopathic hemolytic anemia, and raised serum lactate dehydrogenase (S-LDH); the features were suggestive of classic pentad of TTP, no other specific investigations were done, the patient was diagnosed to be case of Thrombotic Thrombocytopenic purpura (TTP) and was urgently treated with plasma exchanges and steroids.

Results: During treatment, the patient responded well to plasma exchanges and his platelet count rose from 150000/ul baseline to 150000/ul on day 8, but on tapering the plasma exchanges the platelet count decreased to 40000/ul on day 10, indicating it to be case of refractory TTP. The patient was then started with rituximab 375 mg/m2 per week for 4 weeks, which increased the clinical condition of patient significantly.

Summary/Conclusions: The case emphasizes the role of rituximab in cases with refractory TTP and concludes that rituximab should be considered in TTP patients who fail to respond after 7-14 days of standard treatment with daily plasma exchanges and glucocorticoids.

P-544

THE EFFECT OF STORED PLATELET TRANSFUSION ON THE INFLAMMATORY PROCESS OF HEPATIC TISSUE IN A SERUM AMYLOID A-LUCIFERASE TRANSGENIC MICE
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Background: Serum amyloid A (SAA), a major acute phase protein predominantly secreted by hepatocytes, increased up to 1000-fold after infection or trauma. Platelets are essential for primary hemostasis and are also involved in inflammation and immune regulation. The storage temperature (such as 22°C or ~80°C) and storage time (0 ~ 5 days at 22°C) of platelets is associated with the intensity of inflammatory response after platelet transfusion.

Aims: To determine the effect of stored platelet on inflammatory process of hepatic tissue by using SAA transgenic mice.

Methods: Male SAA-luciferase transgenic mice were subjected to a volume-controlled hemorrhage by withdrawal of 30% of blood volume (21 ml/kg body weight) over 1 h, and then were transfused with fresh platelets (FPs), liquid-stored platelets (LPPs), Cryopreserved platelets (CPPs), or fresh frozen plasma (FFP) respectively at a volume equal to the blood loss. A control group received no transfusion. The induction of liver luciferase expression was detected at 1 h, 3 h, 6 h, 9 h, 24 h, 48 h and 72 h after transfusion by bioluminescent imaging system.

Results: The changes of SAA luciferase activity with time were similar among groups with a trend of increasing first and then decreasing. However, the peak time was different with 6 h after FFP or CPPs transfusion, 9 h after LPPs transfusion and 24 h after CPPs transfusion. The peak SAA luciferase activity was highest in the LPPs group, and then in the CPPs group, followed by the FPs group and the FFP group. Compared with the control group, the SAA luciferase activity was lower in the FFP group at each time point, but higher in other groups.

Summary/Conclusions: Transfusion with LPPs or CPPs contributes to SAA expression in hepatic tissue. In vivo monitoring the SAA-luciferase activity could be used to investigate the effects of platelet transfusion on the inflammatory response of the liver.

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EARLY CORRECTION OF COAGULOPATHY CAN REDUCE THE 28 DAY MORTALITY IN ADULT PATIENTS WITH MAJOR BURN
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Background: Early stage correction of coagulopathy has not been found to reduce the 28 day mortality rate in adults with major burn. Aims: Investigate the relationship between early correction of coagulopathy and the 28 day mortality in patients with major burn.

Methods: 503 cases of patients with burn injury from January 2015 to May 2017 were found in Jiangxi province burn center, 73 cases of major burn transfusion patients with coagulopathy on admission were included in the study, according to early coagulopathy (on admission 48 h) was corrected or not, the patients were divided into the experimental group (early coagulopathy correction group, n = 40) and control group (early coagulopathy without correction group, n = 33), compared with two groups of basic clinical data and clinical prognosis indicators, logistic regression analysis and survival curve were also used.

Results: [1]The gender, age, weight, burn causes, inhalation injury, INR, APTT, 48 h urine volume and fluid volume after admission, the amount of frozen plasma transfusion and INR in 48 h after admission were not significantly different (P > 0.05);

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the two groups in TBSA, III degree burn area, 24 h urine volume and fluid volume, the amount of fresh frozen plasma and APTT in 48 h were significantly different (P < 0.05); (2) Comparison showed related prognostic index: two groups' burn ICU hospitalization time and hospitalization time were not statistically significant different (P > 0.05). Mechanical ventilation time of experimental group were longer than the control group, the 28 day mortality rate was lower than that of the control group, the differences were statistically significant (P < 0.05); (3) The results of Logistic regression univariate analysis showed TBSA, III degree burn area, inhalation injury, length of stay, mechanical ventilation time, the amount of frozen plasma and the amount of fresh frozen plasma transfusion and correction of coagulopathy in 48 h after admission had effects on 28 days mortality of major burn transfusion patients with coagulopathy (P < 0.05); the two groups are remant unclear, burns, burn ICU hospitalization time, INR, APTT on admission, the amount of fresh frozen plasma transfusion after 48 h, INR and APTT after 48 h had no effects on 28 day mortality (P > 0.05); (4) The results of multivariate Logistic regression analysis showed that mechanical ventilation time, length of stay, inhalation injury were not independent influence factors (P > 0.05);TBSA, III degree burn area, and the amount of frozen plasma transfusion and correction of coagulopathy in 48 h after admission were independent influence factors (P < 0.05). (5) Survival curve analysis of major burn transfusion patients with coagulopathy showed that with different TBSA, different III degree burn area, different amount of frozen plasma transfusion and whether coagulopathy corrected or not in 48 h, the difference in 28 day survival rate were statistically significant (χ2 = 24.128, 41.688, 26.055, 18.452, P < 0.05). Summary/Conclusions: TBSA, III degree burn area, the amount of frozen plasma transfusion and correction of coagulopathy in 48 h after admission are independent influence factors on 28 day mortality. Increasing the amount of frozen plasma transfusion, especially the fresh frozen plasma transfusion, can achieve the dual purpose of anti shock and correction of coagulopathy, improve the prognosis and reduce the mortality of 28 days.

P-546
ANALYSIS OF INFLUENCE OF CLINICAL OUTCOMES OF CRYOPRECIPITATE INFUSION IN PATIENTS WITH EARLY POSTPARTUM HEMORRHAGIC SHOCK
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Background: The effect of cold precipitation on the prognosis and prognosis of postpartum hemorrhage and hemorrhagic shock is uncertain.

Aims: To investigate the influence of cryoprecipitate on clinical outcome of patients with early postpartum hemorrhagic shock.

Methods: Retrospectively analyze 63 patients with early postpartum hemorrhagic shock in our hospital. According to the presence of cryoprecipitate infusion divided into research group (transfusion of red blood cells, plasma, platelet and cryoprecipitate, n = 34) and the control group (infusion of red blood cells, plasma, platelet, n = 29), and analyzed two groups of patients clinical data characteristics, blood transfusion volume, liquid input volume, the curative effect after transfusion, and clinical outcome prognosis related indicators.

Results: 1) The age, delivery mode, pathogenesis, hemostatic and surgical procedures of two groups had no statistical significant difference (P > 0.05); 2) Compare before and after transfusion: the level of fibrinogen on research group had statistical differences 0.83 ± 0.22 vs 1.46 ± 0.32 (P < 0.05), while the difference had no statistically significance on control group, PT and APTT of two groups had improved after transfusion (P < 0.05). Compare research group and control group: bleeding amount (ml) were 1474 ± 481.45 vs 1972 ± 633.78 (P < 0.05), the average infusion dosage of red blood cells (U) respectively were 7.53 ± 1.48 vs 9.72 ± 2.19 (P < 0.05), the infusion dosage of plasma (ml) respectively were 826 ± 104.43 vs 1041 ± 221.89 (P < 0.05), the platelet infusion volume (U) respectively were 24 ± 3.0 vs 26 ± 5.3 (P > 0.05), liquid input volume (ml) respectively were1395 ± 256 vs 2143 ± 309 (P > 0.05), the improvement rate were 88.2% vs 62.0% (P = 0.05); (2) Comparison showed related prognostic index: the incidence of pulmonary edema were 8.8% vs 24.3% (P < 0.05), the average hospitalization days (d) were 10.73 ± 2.46 vs 17.88 ± 3.15 (P < 0.05).

Summary/Conclusions: Early infusion of cryoprecipitate can correct hypofibrinemia and control bleeding timely, can reduce the volume of red blood cells and plasma in patients with early postpartum hemorrhagic shock, then reduce the incidence of complications, and have a better clinical outcome of patients.
Results: The whole blood samples obtained from 20 healthy volunteers were divided into 3 groups according to the intraoperative autologous blood transfusion amount of group A was < 200 ml, the blood transfusion amount of group B was 200 ml - 500 ml, and the blood transfusion amount of the group C was > 500 ml. Test the level of hemoglobin (Hb), red blood cells deposited (Hct), platelet count (Plt), prothrombin time (PT), partial prothrombin time (APT), thrombin time (TT), partial thrombin time (APTT) and fibrinogen (FIB) before the operation, and the levels before and after autologous transfusion.

Results: The Hb and Hct of group A were improved before autologous transfusion (P < 0.05), and the Plt and coagulation function indexes were not significantly different (P > 0.05). In group B, Hb and Hct were improved before autologous transfusion, PT and APTT extended, FIB decreased (P < 0.05). In group C, the Plt and coagulation function decreased more obviously after the autologous transfusion (P < 0.05), and the Hb and Hct were significantly improved after the autologous transfusion (P < 0.05).

Summary/Conclusions: Intraoperative autologous blood transfusion can effectively reduce the dosage of allogeneic blood transfusion in cardiac surgery patients, but for surgery patients with severe blood loss, blood coagulation function of patients should be monitored and fresh plasma, platelets or other blood coagulation factors should be supplied promptly.

P-554
THE EFFECTS OF AUTOLOGOUS BLOOD TRANSFUSION ON COAGULATION FUNCTION IN PATIENTS WITH CARDIAC SURGERY
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Background: The effect of autologous blood transfusion on coagulation function is not clear.
Aims: Analyze the effect of blood transfusion on the function of coagulation in patients with cardiac surgery.
Methods: 216 patients with cardiac surgery using autologous blood transfusion technique were divided into 3 groups according to the intraoperative autologous blood transfusion. The blood transfusion volume of group A was < 200 ml, the blood transfusion amount of group B was 200 ml - 500 ml, and the blood transfusion amount of the group C was > 500 ml. Test the level of hemoglobin (Hb), red blood cells deposited (Hct), platelet count (Plt), prothrombin time (PT), partial prothrombin time (APTT) and fibrinogen (FIB) before the operation, and the levels before and after autologous transfusion.

Results: There was a strong correlation between rivaroxaban plasma concentrations and the TEG parameters R time (Spearman correlation coefficient 0.29). R time was significantly prolonged in samples obtained 3 h after rivaroxaban therapy compared to those obtained before therapy (P < 0.05).

Summary/Conclusions: TEG could be a valuable test for rapidly determination of the effect of rivaroxaban at the point of care when needed.

P-551
TO INVESTIGATE THE RISK FACTORS OF OBSTETRIC TRANSFUSION
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Background: Obstetric hemorrhage is the major leading cause for the death of obstetrical patients.
Aims: To investigate the risk factors of obstetric transfusion.
Methods: 9000 cases of obstetrical inpatients from December 2015 to December 2016 were analyzed by using univariate analysis and logistic regression analysis.

Results: The results of logistic regression analysis indicated that cesarean delivery (OR 3.6, 95%CI 1.2-5.6), abnormal placentation (OR 25.4, 95%CI 17.8-31.0), preeclampsia (OR 11.0, 95%CI 6.7-19.2), leiomyomas (OR 16.5, 95%CI 9.3-21.1) and prenatal hemoglobin less than 70 g/l (OR 35.1, 95%CI 29.6-43.2) were risk factors associated with transfusion (P < 0.01). The abnormal placentation and prenatal hemoglobin less than 70 g/l had the strongest correlation with transfusion.

Summary/Conclusions: The risk factors mentioned above, especially abnormal placentation and prenatal hemoglobin less than 70 g/l, were significant risk factors associated with obstetric transfusion. Clinicians should pay more attentions to the prenatal checks and care, and assure the reasonable and safe transfusion for the obstetrical patients.

P-552
ANALYSIS OF BLOOD USAGE OF 465 CASES BURNED PATIENTS IN CHINA
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Background: Burns often cause high temperature damage to the skin tissue. Large area of deep burn can cause blood volume reduction, lack of energy supply, coagulation abnormalities and red blood cell loss and other systemic changes. Therefore, burn treatment often requires blood transfusion.
Aims: To analyze the actual blood usage in burned patients, providing useful reference for rational clinical use of blood.
Methods: Retrospective analysis of 465 cases of burned patients with types and amount of transfusion, in the local hospital from January 2014 to December 2015. Results: There are 306 males (65.81%) and 159 female (34.19%) in 465 cases. The age range is from 2 months to 90 years old (Table 1). The amount of red cell transfusion was 1547.50 U, the amount of plasma transfusion was 5235.20 U, and the amount of platelet transfusion was 14. In this research, under 3 years of age accounted for the largest proportion of patients (14.90%). The maximum amount of blood transfusion was 40-49 age group (1446.5U, 20.81% of the total). The maximum amount per capita output was 50-59 age group (30.51U). The red blood cell and plasma volume were the most in patients with extremely severe burn patients (5.18U and 18.41U, respectively).
Summary/Conclusions: Actually there is not a standardized blood transfusion program for burn patients in China. The clinician carries transfusions through experiences and blood stock. As a result, the use of blood is abused and non-standard. According to the patients themselves, a scientific and reasonable component transfusion scheme is needed.
Severe burns 168 5.18
Massive 179 2.11
Moderate 104 2.53

Vox Sanguinis (2017) Qingdao University, Yantai 2Peking University Health Science Center, Beijing, China
© SY u1, X Zhao1, Z Lee1, S Pang1, Q Yang1 and Y Lin2

Abstracts

Degrees Numbers Red Blood Cells (U) Plasmas (U) Platelets (U)
Mild 14 2.64 ± 4.5 9.61 ± 17.43 0 ± 0
Moderate 104 2.53 ± 3.59 4.69 ± 11.53 0 ± 0
Massive 179 2.11 ± 3.78 8.54 ± 12.42 0 ± 0
Severe burns 168 5.18 ± 9.16 18.41 ± 28.28 0.08 ± 0.58

P-553

MULTI-ANTIBIOTIC-INDUCED AUTOIMMUNE HAEMOLYTIC ANAEMIA IN A PATIENT WITH RARE RH-NULL SYNDROME

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Background: Drug induced immune haemolytic anaemia (DIHA) and rare blood groups both cause a huge challenge in clinical transfusion. The frequency of DIHA was 10% in drug induced haematological states and status and fatality rate of DIHA was 6.6% in China. Patients with the Rhnull phenotype are negative for RhD and RhCE antigens, resulting in major challenges with transfusion because anti-Rh 29 reacts with D, C, c, E, and e antigens, which are typically present in these patients. In a study in Sweden, the estimated incidence of Rhnull was 0.0001-0.0002 for the amorph haplo-type. Because the RhD-negative phenotype is present in less than 1% of the population in Central Asia, we expect that the incidence of this phenotype may be lower in Chinese individuals than in Caucasians.

Aims: To present a case of sulfobactam combine with cefoperazone and Moxifloxacin induced severe autoimmune haemolytic anaemia [AIHA] in a patient with Rhnull syndrome.

Methods: The haematological clinical condition was examined using Coombs test, and measurements of reticulocyte count, bilirubin level, serum haptoglobin. To confirm the drug type that led to the haemolytic disease, drug-sensitized O Rh-null cells reacting to the patient’s plasma, using the micro-agglutinin test, were identified. Phenotyping and genotyping of RhD, RhCE, and sequencing exons of RhD, RhCE and RhAG, were conducted to identify the Rh-null blood type.

Results: Case summary: A 53-year-old man was diagnosed with severe AIHA, along with a haemoglobin (Hb) level that had dropped from 106 g/l at Day 0, due to antibiotic therapy, to 44 g/l at Day 7 and a reticulocyte count that was 3.75 g/l at Day 8. Erythropoietin, folic acid, and iron were continuously supplied because Rh-null syndrome presents with stomatocytes which, in turn, lead to a shortened RBC survival period, and to avoid the risk of immunization through blood transfusion. DIHA was suspected by the medical transfusion laboratory staff and corticosteroid treatment was started immediately at Day 7, apart from antibiotic therapy. The Hb level increased uneventfully from 53 g/l at Day 9 to 81 g/l at Day 15.

Laboratory examination for transfusion: The patient’s plasma reacted to cefoperazone-sensitized O Rh-null cells, and moxifloxacin-sensitized O Rh-null cells were positive 4+. ABL plasma from a donor reacted to cefoperazone-sensitized O Rh-null cells, and moxifloxacin-sensitized O Rh-null cells were trace positive. The patient’s plasma combination with cefoperazone and moxifloxacin reacted to the O Rh-null cells, giving a positive 4+ result. The ABL plasma combination with cefoperazone and moxifloxacin reacted to O Rh-null cells, giving a trace positive result. A direct Coombs’s test and auto-control for the patient were positive 1±, and the patient’s plasma reacted with O Rh-null cells to give a positive 2+ result. Antibody identification reported anti-E, a shift to anti-c, followed by anti-Rh29 along with anti-E, before the Hb level declined, and phenotyping of CDCe RBC products (the same as the patient’s genotyping) were used on transfused blood from the previous month.

Summary/Conclusions: Moxifloxacin and cefoperazone can induce autoimmunity and mimic primary haematological diseases. In general, autoimmune haemolytic anaemia leading to severe haemolysis is rare, but antibiotic and NSAID drug therapies should be used with caution. In patients with a rare blood group, drug treatments should be administered with care and caution.

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P-554

IN VIVO IMAGING THE ACTIVATION OF ALVEOLAR MACROPHAGES DURING THE PROGRESSION OF TRANSFUSION-RELATED ACUTE LUNG INJURY

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Background: Transfusion-related acute lung injury (TRALI), a syndrome of respiratory distress caused by blood transfusion, is the leading cause of transfusion-related mortality. Alloantibodies (AMs), as one of the resident macrophage populations, are critical to the initiation and resolution of lung inflammation. However, the role of AMs in the pathogenesis of TRALI-associated lung failure is incompletely understood.

Aims: To track in real time the activation of AMs in the progression of TRALI and uncovered the mechanism by which AMs contribute to the pathogenesis of 34-1-2s- induced acute lung injury.

Methods: A novel lentivectorial vector (Lenti-IL6P-luc-P2A-AcGFP) encoding the firefly luciferase (Fluc) together with the enhanced green fluorescent protein (eGFP) reporter gene under control of IL-6 promoter regulatory elements was developed. Lenti-IL6P-luc-P2A-AcGFP was administered to recipient BALB/c mice by intratracheal (IT) installation. The localization of transgene expression was investigated by bioluminescence imaging and flow cytometry. LPS was used to induce the activation of IL-6 promoter. To induce TRALI BALB/c mice were first challenged with i.p. lipopolysaccharide (LPS), and then transfused with MHC I mAb (34-1-2s) via the tail vein. Bioluminescence imaging was executed using an IVIS Spectrum system.

Results: The combination of reporter genes allows for independent tracking of transfused (GFP+) cells by flow cytometry in addition to continuous, real-time assessment of IL-6 activation levels by luciferase expression. We confirmed that the Lenti-IL6P-luc-P2A-AcGFP treatment result in transduced AMs in mouse lung and the kinetics of IL-6 activation correlated nicely with imaging-detected luciferase activity. We next used this reporter mouse model to investigate the impact of TRALI on AMs. Our results indicated that the TRALI progression is accompanied with IL-6 activation in AMs.

Summary/Conclusions: The major findings of this study are that (a) AMs were activated in the TRALI progress, which will help to understand the pathogenesis of TRALI (b) a stable reporter expression mouse model for in vivo imaging of IL-6 activation in AMs is successfully established, which provide the basis for study of the pathogenesis of a variety of inflammatory lung disease.

P-555

THE DYNAMIC CHANGE IN POTASSIUM LEVEL AFTER RED BLOOD CELL TRANSFUSION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: There is no unanimous consensus on whether the potassium concentration (K+) in stored red blood cell (RBC) supernatant affects the post-transfusion potassium level of the recipient.

Aims: We conducted this meta-analysis to assess the dynamic change in potassium levels following transfusion.

Methods: We searched the PubMed, Embase, Web of Science and China National Knowledge Infrastructure (CNKI) databases from January 1971 to June 2016. Forest plots were constructed for the included studies. The overall effects were evaluated by using the Z-score. Subgroup and sensitivity analyses were used to discover the source of heterogeneity.

Results: The meta-analysis included 2,057 participants from 38 studies. The pooled result showed that the blood potassium levels of patients were significant different between pre- and post-transfusion [MD = -0.17, 95%CI (-0.29 to -0.04)] and that the whole blood potassium levels of patients during transfusion were not different to those pretransfusion [MD = -0.06, 95% CI (-0.32 to 0.21)]. Although the [K+] was...
significantly increased in patients at 1–4 h [MD = -0.43, 95% CI [-0.48 to -0.37]] and 12 h post-transfusion [MD = -0.11, 95% CI [-0.47 to -0.15]] compared to that in patients pretransfusion, there was no difference in the [K+] in patients pretransfusion and 24 h post-transfusion [MD = 0.11, 95% CI [-0.17 to 0.38]]. The blood [K+] in the post-transfusion samples from the massive transfusion (MT) group was significantly higher [MD = -0.09, 95% CI [-0.13 to -0.06]] than that in those from the non-massive transfusion group.

Summary/Conclusions: We demonstrated that there was a significant risk of hyperkalemia after blood transfusion, particularly in the MT group. The incidence of hyperkalemia was significantly increased at 1–4 h and 12 h post-transfusion. Our research could help clinicians design better strategies to avoid and treat transfusion-associated hyperkalemia.

**P-556**

REPORTING AND EVALUATING TRANSFUSION-RELATED ACUTE LUNG INJURY (TRALI) CASES AT A TERTIARY CARE CENTRE OVER LAST FIVE YEARS

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Background: Transfusion-related acute lung injury (TRALI) is a syndrome characterized by the development of new onset acute respiratory distress with hypoxemia during or up to 6 h after completion of a blood transfusion. Transfusion-related acute lung injury (TRALI) is a rare but potentially fatal complication of blood product transfusion.

Aims: The diagnosis and reporting of TRALI will allow better understanding of the incidence, clinical course and associated mortality of this reaction. Furthermore, by identifying cases of TRALI, steps can be taken to prevent further cases of TRALI by investigating donors involved in these cases and deferring them from further donations if they are found to be implicated.

Methods: This is a retrospective review of blood transfusion reactions during past five years [January 2010 to September 2014]. The record of the total number of transfusions was obtained from electronic blood bank information system. All TRALI cases were identified from manual review of reported transfusion reaction forms. For detailed information of all TRALI cases, medical record charts of patients were reviewed. The record of donors implicated in TRALI cases was derived from Blood bank system.

Results: Total number of transfusions during study period was 291,041. Six cases of TRALI were reported during this period. Rate of TRALI per 100 units transfused was calculated to be 0.02%. The mortality associated with TRALI was 33.3%. TRALI occurred following transfusion of fresh frozen plasma in 4 patients, cryoprecipitate in 1 patient and packed red blood cells in 2 patients. In all cases, the donors were male.

Summary/Conclusions: The rate of TRALI reported to our blood bank was found to be 0.02% which is very low as compared to international data. This shows that TRALI is under reported in our setting. Education and reinforcement is required to create awareness about importance of diagnosing and reporting TRALI cases.

**P-557**

THE INCIDENCE AND TYPE OF TRANSFUSION REACTIONS IN SICHUAN PROVINCE IN CHINA BASED ON THE US HEMOVIGILANCE REPORTING SYSTEM

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Background: The incidence and type of adverse transfusion reactions in China have not been well studied. We investigated the reported transfusion reactions of 66 hospitals in Sichuan province in 2015.

Aims: To better understand the actual condition of transfusion reactions in China and provide data support for establishment of Chinese future hemovigilance system.

Methods: The reported transfusion reactions in 66 hospitals in 2015 of Sichuan province were studied retrospectively based on the US hemovigilance reporting definitions. These hospitals distributed in 12 different cities in Sichuan and we selected them randomly. We reviewed the patients’ case history and tried to evaluate and classify the transfusion reactions again. We not depended on the hospital’s reported results and limited to them entirely, any signs or symptoms related to transfusion reactions were analyzed all over again.

Results: A total of 632 transfusion reactions were reported between 1 Jan 2015 and 31 Dec 2015 and 596 (94.30%) reactions were identified as appropriate for study inclusion according to definitions by the US hemovigilance reporting system. Of these 596 transfusion reactions, 253 (42.45%) were febrile non-hemolytic transfusion reactions, 305 (51.17%) were allergic transfusion reactions, 11 (1.85%) were transfusion-associated dyspnea reactions, 1 (0.17%) were hypotensive transfusion reaction, and 26 (4.36%) were unknown reactions. No transfusion-associated circulatory overload, transfusion-related acute lung injury, hemolytic transfusion reaction and transfusion-transmitted infection were observed.

Summary/Conclusions: Febrile non-hemolytic transfusion reaction and allergic transfusion reaction were the most common types of transfusion reactions in Sichuan. Some patients’ transfusion related information and follow-up check results in case history were not complete and affected the judgment of transfusion reactions in some sense unavoidably. Further study was also needed to better observe the actual association of transfusion reactions in China and the national hemovigilance system should be established as soon as possible.
P-559 RETROSPECTIVE STUDY OF 276 CASES OF ACUTE TRANSFUSION REACTION IN A CHINESE WOMEN AND CHILDREN’S HOSPITAL

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Background: Acute transfusion reactions present as adverse signs or symptoms during or within 24 h of a blood transfusion. Some need resolve promptly without specific treatment or complications, while some are rare, but can be life threatening. Prompt recognition of an immune-mediated transfusion reaction is fundamental to improving patient outcome.

Aims: Through retrospective analysis of all acute transfusion reaction cases in a Women’s and Children’s Hospital over recent 2 years, to understand the characteristics of acute transfusion reaction in an Chinese women and children’s Hospital, helping provide effective strategy for blood transfusion for women and children.

Methods: Collating the blood transfusion data and the transfusion reaction information from the Blood Bank laboratory of West China Second University Hospital from January 2015 to December 2016. Parameters reported in this study include: transfused blood type, transfusion volume, transfusion aim, transfusion efficiency and disease diagnosis, incidence of transfusion reaction, etc. A total of 276 cases of acute transfusion reaction were reported by the clinician over past 2 years were enrolled in this study.

Results: For these 276 cases of acute transfusion reaction, there were 34,043 person-times transfused during the past 2 years, the incidence of transfusion reaction is 0.8% (276/34,043). Classify the transfusion reaction according to the severity, the mild transfusion reaction is accounting for 63.77% (176/276), the moderate is 36.23% (100/276), and there was no serious blood transfusion reaction yet. For different blood components, the platelet was the most common transfusion reaction, was 2.60% (149/5,727), and followed by plasma (0.76%), red blood cells (0.32%) and cryoprecipitate (0.16%). In different populations, the most susceptible to blood transfusion reaction were the pediatric patients, and the incidence was 0.98%; of which the main patients were those with blood system disease, accounting for 67.76%. The rate of patients with the history of blood transfusion or pregnancy of all was 93.84%.

Summary/Conclusions: Women and children patients with transfusion reactions is given priority to mild transfusion reaction, platelets are the most common blood components leading to transfusion reactions. Pediatric patients are the most susceptible to blood transfusion reaction in women and children. The proportion of patients with blood system disease, blood transfusion history, or pregnancy history was in the majority.

P-560 SEPTIC PLATELET TRANSFUSION REACTIONS

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Background: Septic platelet transfusion reactions (SPTRs) are the most common, serious risk of transfusion today in Egypt. Although public concern has largely focused upon the declining risks of the transmission of viral agents causing hepatitis or AIDS, the persistent risk that bacterial contamination of platelets may cause SPTRs is generally not appreciated. National blood transfusion service previously reported that the risk of an SPTR approaches 1 in 1,000,000. Poisson distribution was used to determine whether recipients of Platelet components transfused had a risk of septic transfusion reaction. The risk of SPTRs were counted 9 times higher than that of SDTRs due to SDPs.

Summary/Conclusions: The use of SDPs is a simple means of reducing SPTRs. Other measures such as sterilization will be required to eliminate all SPTRs.

Haemovigilance and Transfusion Safety

P-561 TRANSFUSION OF RH-D POSITIVE UNITS TO A DEL PATIENT: A CASE REPORT IN A LOCAL TERTIARY HOSPITAL

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Background: The RhD antigen is highly immunogenic and can cause severe immune haemolytic anaemia in transfusion. The frequency of RhD(+) phenotype in Asians is <0.5%. This severely limits the supply of RhD(+) blood in Asia. Approximately 30% of RhD(+) Asian individuals carry a RhD variant, termed “Asia type” DEL. It is postulated that individuals with DEL variants express normal RhD phenotype and thus pose virtually no risk of forming anti-D.

Aims: Literature search has not revealed reports pertaining to DEL variant patients receiving large volume of RhD(+) red blood cells (RBC) and how this exposure may contribute to Anti-D formation. A DEL variant patient in our facility received RhD(+) blood products and development of Anti-D was retrospectively evaluated.

Methods: A 41 year old Chinese male with liver cirrhosis secondary to chronic Hepatitis B infection was admitted in December 2012 for a cadaveric liver transplant. In 2011, he was typed as RhD(+) with a negative antibody screen on 4 anti-body screening tests. He was transfused with 4 units RhD(+) Platelets (PLT). Anti-D prophylaxis was not administered. He did not develop Anti-D when he was typed on 4 subsequent occasions. In the immediate pre-transplant, 10 units of RhD(+) RBC were requested for the surgery. Due to rarity of RhD(+) donors in Asia, it was decided to test the patient for DEL. Weak and Partial RhD phenotype was performed with 2 different types of Anti-D reagent (Diaagnost TOTEM and Bioscot) and Ortho ABORH/Rev Cassette. RhD adsorption and elution was performed. A saliva sample for DNA extraction was used for RhD genotyping by BLOODchip method (Progenika) for confirmation. Phenotyping for the other Rh antigens using serological technique was also performed.

Results: Weak and partial RhD was not detected with serological methods. Adsorption and elution showed the presence of RhD antigen on his red cells. Genotyping showed Del RhD1227A mutation. Phenotyping revealed CcEe antigen expression. The “Asia type” DEL was determined on this patient. Due to the difficulty in obtaining RhD(+) RBC and despite the presence of DEL, he went on to receive RhD(+) blood products (12 units of RBC, 4 random PLT and 2 pooled PLT) for his liver transplant. Anti-D prophylaxis was not administered during or after his surgery. For prevention of graft rejection, he received a combination of immunosuppressants (mycophenolic acid, tacrolimus and prednisolone) post operatively. Antibody screen performed in the immediate 2 weeks post operatively and 6 months later did not reveal Anti-D. There was also no evidence of hemolysis detected post transfusion.

Summary/Conclusions: This case supports the biochemical observations that the DEL variants express normal RhD and may have low risk of Rh alloimmunization. A lower rate of alloimmunization was also seen in heavily immunosuppressed RhD(−) patients (Komal, Transfusion, 2017). This may be one of the contributory factors in the lack of alloimmunization in this patient. In an Asian population, where RhD(−)
blood is in short supply, the use of RhD(−) blood may be relatively safe in a "Asia
type" DEL patients. Adopting such a policy can lessen the need for RhD(−) blood in
"Asia type" DEL patients. However, additional evidence needs to be gathered to
implement such a practice. Other DEL types may still be at risk of Rh alloimmuniza-
tion. The "Asia type" DEL needs to be specifically detected in a RhD(−) Asian
patient to clearly define this group of patients where the practice applies.

P-562
Abstract has been withdrawn

P-563
RATE OF RED CELL ALLOIMMUNIZATION IN TRANSFUSED
PATIENTS IN A SINGLE LOCAL INSTITUTION
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Background: Antibodies produced in patients can occur after transfusion or
pregnancy. Alloimmunization rate has been reported from 0.3% to 38% [Walker, AABB, 2011]
depending on different study groups and sensitivity of testing methods. Prior to transfusion, the compatibility testing or crossmatch has been
an important procedure to determine the safety of red cells transfusion.

Aims: A retrospective analysis of patients who developed red cell antibodies and their transfusion history prior to red cell antibody formation was collected. Our
aim is to determine the rate of alloimmunization in patients who received prior transfu-
sions; the most common type of antibodies and the number of red cell transfusions
before antibody(ies) formation.

Methods: Blood group and antibody screening was performed using column agglu-
tination technique (CAT) using the AutoVue System from Ortho-Diagnostics. Elec-
tronic crossmatch (EC) was performed using HCL Transfusion from Mediware which
was validated on site for EC procedure. The Immediate Spin (IS) crossmatch was per-
formed by the traditional tube technique. Antibody identifications was performed
with commercial panels cells (Ortho or Immucor) using CAT. The following data for
each recipient who developed antibody(ies) were captured from July 2015 to June
2016 - number of red cell transfusion before recipient develop antibody(ies) and
specificity of antibody(ies).

Results: A total of 3858 patients received red cell transfusions in our institution.
344 patients developed antibody(ies) during the one year period. 84 had documented
prior transfusions in our institution, crossmatch being performed either by IS or EC.
260 had no known transfusion in our institution (these patients may have received
transfusion in another hospital); hence they will be excluded from this analysis.
Total rate of alloimmunization in our institution was 9% (344/3858), Of which 2.2%
(84/3858) had prior known transfusions - a total of 66 significant alloantibodies
were detected, the two most common being Anti-MIA (30/66, 45%) and Anti-E (24/
66, 36%). Majority of the patients 55% developed antibodies between 0 to 5 transfu-
sions (36/66), 21% (14/66) developed antibodies between 6 to 10 transfusions and
23% (15/66) developed antibodies after more than 10 transfusions. Between 1 to 5
transfusions, 19 developed Anti-MIA and 12 developed Anti-E.

Summary/Conclusions: Our data show that rate of alloimmunization in patients
who received prior transfusion to be 2.2%. This is similar to the reported range (2%-
9%) [Forney, Transfusion, 2008] for multiply transfused patients. The usage of EC
and IS XM for transfusion did not show an increase in alloimmunization rate. The
most common antibodies detected, Anti-MIA is not unexpected as the MIA antigens
has been shown to appear at higher frequency in Chinese and Southeast Asians,
15% [Reid, 2011]. Anti-MIA has been reported to cause haemolytic transfusion reac-
tion and haemolytic disease of the new born; hence the usage of MIA cells has been
included in the screening cells in our institution. This may have accounted for the
high frequency detected in our patients. The Rh blood group system has been shown
to be most immunogenic; hence Anti-E was the second most detected antibody. Due
to high prevalence of D antigen (99% in Asians), there was no anti-anti-D detected in
this analysis. Most patients (36) developed antibodies within 0 to 5 transfusions in
our institution, correlation between number of units transfused and alloimmuniza-
tion rate has not been clearly associated.
were also used to explore influencing factors associated with HIV infection among this subpopulation.

Results: From 2002 to 2016, there were altogether 1, 302, 161 voluntary blood donors in a certain blood bank in Liaoning province, among which 215 were detected as HIV positive. The average HIV screening positive rate was 16.53/100,000, and it significantly increased from 3.92/100,000 between 2002 and 2004 to 27.29/100,000 between 2014 and 2016 (P for trend<0.001). 86 HIV-positive blood donors between 2014 and 2016 were chosen as the case group, while 430 eligible HIV-negative blood donors were chosen as the control group paired with the donation year. Compared with HIV-negative blood donors, the proportions of the younger, male, being unmarried, non-local residents, and first-time donors of HIV-positive donors were significantly higher (all P ≤ 0.05). According to conditional multivariate logistic regression analysis, aged between 18 and 25 years old, aged between 26 and 35 years old, male, being unmarried, and first-time donors were more likely to get infected with HIV infection among voluntary blood donors (all P < 0.05).

Summary/Conclusions: HIV screening positive rate of voluntary blood donors in the study was relatively high and showed a significantly increasing trend, which implies that the proportion of blood donation from HIV-related high-risk population is growing as well. Though the window period of nucleic acid testing is quite short, there still exists a certain degree of hidden risk regarding blood safety. Relevant health departments should list the younger, male, unmarried, and first-time donors among voluntary blood donors as the key screening and intervention subpopulations to improve blood safety.

P-567
EVALUATION OF TRANSFUSION REACTION INCIDENCE FOR THE LAST 3 YEARS IN THE SANGLAH GENERAL HOSPITAL DENPASAR BALI INDONESIA
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Background: Transfusion reaction is one of the indicators of hospital service quality that must be monitored and reported. Data on the adverse effects of transfusion delivery nationally have not been reported. One of the factors that become obstacles in the implementation of hemovigilance program in Indonesia is the variation in the ability of blood service between regions. Monitoring and reporting of transfusion reaction incidence is very important not only for the patients’ safety but also very useful in improving the production quality of blood products.

Aims: The purpose of the study was to evaluate the incidence of transfusion reactions that are beneficial in improving the blood service system including improving the production quality of blood products. This study is also expected to be the pioneer and driving force in the implementation of the national hemovigilance program in Indonesia.

Methods: In each unit of transfused blood is always included a transfusion monitoring form which contains data for transfusion reaction reporting. If the patient undergoes a transfusion reaction, a completed monitoring form is filed on the patient’s record and one form is sent to the blood bank along with the patient’s blood sample and the remaining transfused blood unit. Blood bank officers will respond and inputting data in the system. The transfusion reaction data is reported every month, and once every 3 months a meeting is held to discuss the progress of achieving the quality indicators as well as making the planning for improvement.

Results: Over the last 3 years, from July 2014 until June 2017 there were 313 cases of transfusion reactions of 88,385 units of blood transfused. Type of blood products transfused consists of 110 units of WB, 62,214 of FRC, 1906 of WRC, 4424 of FFP, 19,197 of TC, 1032 of TC apheresis, and 970 of Cryoprecipitate. The incidence of transfusion reactions per unit transfused WB is 1: 110, FRC 1: 322, WRC 1: 477, FFP 1: 492, TC 1: 193, TC apheresis 1: 206 and cryoprecipitate was 1: 323. Seen from the type of blood group, A: 28% transfusion reactions occur in transfusion of type A, 1: 27% on group B, 1: 30% on type O, and 1: 184 group of AB. The incidence of severe transfusion reactions occurred in 0.64% of cases, moderate 7.99% and 91.17% were mild cases. Types of transfusion reactions include fever as much as 35.44%, urticaria and other allergic reactions of 48.24%, 11.50% tightness, fever with chills of 2.88% and hypotension of 1.9%.

Summary/Conclusions: Safe and beneficial blood transfusions require standardization at all stages of service both from the donor and patient aspects. From the aspect of the patient, standardization must be performed starting from the determination of indication to the transfusion monitoring. Mistakes in determining indications, identification and pre-transfusion tests can trigger the emergence of severe transfusion reactions. Other components such as blood preparation procedures, screening, storage, distribution, transfusion delivery and monitoring techniques also play a major role in the incidence of transfusion reactions. Good coordination among physicians, nurses, blood banks and all related units is helpful in establishing a safe and effective transfusion chain. At the national level, the implementation of hemovigilance programs is needed to formulate various policies related to blood services so that blood transfusion can provide the greatest benefit with the least risk.

P-568
CLINICAL TRANSFUSION PRACTICE IN SICHUAN, CHINA: A CROSS-SECTIONAL SURVEY
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Background: Blood transfusion is a vital healthcare activity of modern healthcare and blood is a scarce and costly resource. However, it is also associated with significant clinical risks, such as infectious diseases and transfusion related immunologic reactions. Safe, effective and appropriate transfusion practices are important to patients who need transfusion treatment.

Aims: To get full knowledge of clinical transfusion practice in different level hospitals in Sichuan, China from 2011 to 2015.

Methods: This survey was performed by means of a questionnaire which consisted of three parts: basic conditions of transfusion service, utilization of different blood products, and application of autologous blood transfusion (ABT). Data was collected from hospitals with scale, geographic, and even religious diversity in Sichuan, China. Data analysis was conducted in 3 groups according to the official classification of hospital (level 3, level 2 and below level 2).

Results: The questionnaires were sent to 500 hospitals and 384 (76.8%) hospitals answered the questions completely. The mean number of bed, outpatient, inpatient and operation per hospital per year of level 3 hospitals were significant higher than that of level 2 hospitals and hospitals below level 2 (P<0.01 for all comparison) and the mean units of blood used per hospital per year in level 3 hospitals was significantly higher than other two level hospitals (both P<0.01) in the past five years. The usage of whole blood showed significant decreasing trend (P = 0.047) and cryoprecipitate showed significant increasing trend (P = 0.045) from 2011 to 2015. The blood products used most in all hospitals were Red Blood Cells (RBC) and plasma and in level 2 and level 3 hospitals, the inpatient number and operation number were extremely associated with the used units of plasma and RBC (all r ≥ 0.442, P<0.01). The plasma used per operation per year by level 3 hospitals and RBC used per inpatient per year by level 2 hospitals both showed a decreasing trend from 2011 to 2015 (P = 0.047 and P<0.001). In the past five years, the ratio of plasma to RBC units transfused (plasma:RBC) of level 3 hospitals was not lower than 1:18 and the autologous blood transfusions (ABT) rate was not higher than 42.16% in the all three level hospitals.

Summary/Conclusions: The transfusion service level of hospitals in Sichuan, China was closely related to the grade of hospital and it has improved a lot in the past 5 years, especially in level 2 and level 3 hospitals. As the products which used most in all hospitals, RBC and plasma used by level 2 and level 3 hospitals were definitely associated with the number of inpatient and operation and plasma may be overused in level 3 hospitals. Otherwise, whole blood still being used in some hospitals and the autologous blood transfusions rate in Sichuan province still very low. For improving the level of clinical blood transfusion, it’s necessary for the managers of hospitals in Sichuan province to pay more attention to directing clinical blood usage, evaluating clinical transfusion appropriateness and promoting ABT.

P-569
ABD PAD®, EVALUATION OF A NEW MANUAL ABO / RH BLOOD GROUPING METHOD
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Background: As part of the CE marking of the ABD PAD® device, which allows the ABO / Rh group to be confirmed using a new proprietary technology, DIAGAST, associated to the Etablissement Français des Sang de Nantes (French Blood Service) organized a performance evaluation of the product.

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Aims: The purpose of this evaluation was to perform the ABO and RhES group control on 1124 blood donations by comparing the ABAD PAD method with the routine reference method. The main aspects studied were the visual interpretation, time for getting the results, traceability, safety and ergonomics.

Methods: The ABAD PAD method was compared with the EUROLAB Euclone method associated with the BIO-RAD Hema-6 plate.

Results: The DMIV ABAD PAD and the PAD Buffer meet the acceptance criteria: 100% matching samples. The ABAD PAD method is faster, safer and more ergonomic compared to the routine reference method.

Summary/Conclusions: The ABAD PAD method is a new, innovative and reliable method for blood grouping.

P-570
THE RETROSPECTIVE EXPLORATION OF POLYMORPHISM DISTRIBUTION OF BLOOD DONORS’ MILTENBERGER BLOOD TYPE AND GP.MUR BLOOD CLINICAL INFUSION
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Background: Sub system of MNS blood group system is the Miltenberger system, gp.mur is a version of the system, the crowd in Europe is rare, the clinical significance of small, but in some Eastern populations in the distribution of high frequency, it has been shown that the anti-mur antibody can cause hemolytic transfusion reaction (HTR) and hemolytic disease of the newborn (HDN). At present, China has not yet been a routine screening of clinical blood transfusion before Mur antigen, clinical significance and so on gp.mur polymorphism distribution of the Miltenberger blood group system to donate blood. For gp.mur positive blood patients were retrospectively reviewed. The clinical significance of gp.mur positive blood.

Methods: According to the molecular basis of Miltenberger blood group system, specific primers were designed using polymerase chain reaction sequence specific primer (PCR-SSP) screening and sequencing, molecular biology detection method of pcr-ssp-sequencing to establish the Miltenberger blood group system. Serum and verify accuracy of the method using anti -mur standard .A retrospective survey of gp.mur positive blood transfusion in blood donors from 2011–2013, Miltenberger blood group identification and anti-Mur antibody testing and clinical transfusion effect analysis.

Results: This study successfully established the molecular biological detection method of pcr-ssp- sequencing of Miltenberger blood group system. Serological methods to verify fully comply with. Methods 24 cases of Miltenberger blood group positive individuals were screened by PCR-SSP from the voluntary blood donors in Henan nationality, accounting for 0.76%12 patients with gp.mur positive blood transfusion were observed and followed up, of which there were male and female in 4 cases, and the Miltenberger blood group was negative for gp.mur .The sera of patients with anti -mur antibody were 2 and 4, respectively .

Summary/Conclusions: Group Miltenberger blood group system detection blood donors of Han nationality in Henan Province, e gp.mur phenotype, the frequency of 0.9%. Infusion of gp.mur positive red blood cells of the patients developed anti -mur antibody, can cause transfusion reactions, recommend routine screening before blood transfusion of gp.mur blood group.

P-571
HOW TO REGULATE BLOOD TYPE AND SEROLOGY DETECTION TECHNOLOGY IN THE HOSPITALS WITH ON-SITE ASSESSMENT AS THE STARTING POINT
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Background: Through analysis of the situation of on-site operation assessment of blood type and serology test projects in clinical blood hospitals in Qinghai province, to explore the role of on-site assessment in regulating blood type and serology detection technology in clinical hospitals.

Aims: Through analysis of the situation of on-site operation assessment of blood type and serology test projects in clinical blood hospitals in Qinghai province, to explore the role of on-site assessment in regulating blood type and serology detection technology in clinical hospitals.

Methods: The samples taken at the assessment in 2006 were high-titer IgG antibodies. Thereafter, to improve the detection level of each hospital, the titer of IgG anti-body was reduced year by year. Retrospective comparative analysis of the situation of the on-site assessment in 23 clinical hospitals in Xining area in 2006 and 2016 was made.

Results: Compared to 2016, there was only one hospital performing anti-stereotyped tests; all hospitals didn’t carry out Rh(D) stereotypes, antibody screening test and non-hemolytic medium matching test. In the on-site single-blind trial assessment, the anti-stereotyped samples with weakened antibodies in 23 hospitals were failed to be detected; in polybrene medium matching trial, 7 with high-titer antibody samples were detected, and 16 were failed to be detected. While in 2016, all the 23 hospitals with low-titer antibody sample matching were detected.

Summary/Conclusions: Practice has proved that on-site assessment promoted the standardization process of blood type and serological testing in clinical blood hospitals and played a positive role in development of local clinical blood transfusion management, ensuring the safety of clinical blood transfusion.

P-572
15 YEARS EXPERIENCE OF POTASSIUM ADSORPTION FILTER FOR RED BLOOD CELLS
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Background: For potassium overdose, one of the risks of red blood cells (RBCs) transfusion, the potassium adsorption filter was developed in 1998 and was granted manufacturing approval and marketing permission in Japan as a medical device in 2002.

Aims: To confirm safety of the filter: Because of a new product, all cases were asked for post-marketing surveillance mandated from Japanese government. Methods: We have sent a questioners mail all hospitals to use this filter. Results: Post-marketing survey was implemented from May 20, 2002 to January 17, 2005 (2 years and 8 months). In 526 cases 463 filters were used. Average age of patients were 27.6 years (0 - 101 years old; Male: 296 & Female 230). In only one case, hypotension with systolic pressure of 75 mmHg was reported, but not severe.

Summary/Conclusions: Medical device approval: Safety was confirmed in this survey, insurance was applied in 2012, and reimbursement price was obtained as medical equipment in Japan.

Indications of this filter at present:
1. Transfusion to premature infants / neonates
2. Exchange transfusion against fetus or premature neonates
3. Children undergoing extracorporeal circulation
4. Patients who needs emergency rapid massive transfusion on life
5. To remove excessive potassium from transfused RBCs which were raised potassium level due to irradiation or long-term preservation (>5 weeks)

Current use situation: The number of filters used in 2016 was about 65,000, reaching 50,000 in 2010. At present, there were 115 hospitals in Japan using this filter. 36% of hospitals used this filter in 2001 and 80% in 2016.

P-573
REPORT OF INVESTIGATION ON THE 50 GENERAL HOSPITALS’ INFORMATION SYSTEMS USAGE IN CHANGSHA
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Background: In the daily work of the hospital, the Internet has also been widely used. The hospital information management system (HIS), laboratory information management system (LIS), and the hospital transfusion management system (BIS) to achieve seamless docking, the three systems and blood transfusion management information system will become the trend of development.

Aims: To investigate the use of information systems in medical institutions at all levels in Changsha and to understand for information networking between hospitals and all levels of Changsha. The authors have collected and analyzed data on the usage of these systems in general hospitals.

Methods: The survey was conducted through interviews with hospital personnel responsible for information systems.

Results: The survey revealed that all hospitals had implemented HIS, LIS, and BIS, with varying degrees of integration. The usage of these systems varied significantly among hospitals, with some hospitals having well-integrated systems and others having isolated systems.

Summary/Conclusions: The survey highlighted the need for improved integration and standardization of information systems in hospitals to improve efficiency and patient care.

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and blood stations in order to provide a basis for improving the clinical transfusion management.

Methods: Through on-site visits and filling out questionnaires, the use of information systems, software functions, software upgrade and networking requirements of 50 medical institutions at all levels were investigated. There are 20 three-level hospitals, 20 two-level hospitals and 10 first-level hospitals.

Results: Hospital utilization rate of hospital management information system (HIS) and laboratory management system (LIS) of three-level, two-level and the first-level hospitals were 100%, 70% and 30% respectively. The rate of information docking for HIS and LIS were 100%, 35% and 20% respectively. The utilization rate of blood transfusion management system (BIS) and the rate of docking with HIS and LIS were 65% in the tertiary hospitals, and the utilization rate of BIS system in the secondary level and first-level hospital were zero percent. 13 three-level hospitals which using the BIS system have three new functional requirements, such as blood utilization evaluation, blood transfusion adverse reactions and blood transfusion monitoring. 37 clinical hospitals at all levels which didn’t using the BIS system have the use of demand, and hope that the function is comprehensive. In the 37 hospitals which using the HIS and LIS systems, the establishment of Hierarchical Authorization accounted for 81.1%. Login password replacement frequency was set to 3 months, six months, 1 year, accounting for 5.4%, 40.6%, 2% respectively, and no requirements and never replaced were 29.7% and 21.6%. Among the 50 hospitals surveyed, the demand for blood bank information system networking was 98%. Hospitals hope to solve the problems through networking, mainly including understanding of the blood product inventory, the application of blood transfusion, the investigation of adverse reactions in blood transfusion and the tracking of the quality of blood products. The willingness of hospitals to open the blood bank, including blood transfusion products inventory, blood transfusion and difficult samples of related testing information, adverse reactions retroactive blood transfusion; Only 48% of hospitals would open blood transfusion records to blood bank. The main obstacles of information sharing are the cost, technology and information security aspects.

Summary/Conclusions: The construction of information system in all levels of hospitals in our city needs to be strengthened, especially the extensive application and function upgrading of blood transfusion management information system (BIS). The security of information system cannot be ignored. Strengthen the construction of networking between medical institutions and blood stations information systems, break through bottlenecks and achieve the goal of sharing resources, mutual benefit and win-win results.

P-574

THE STUDY OF IRON DEFICIENCY IN A BLOOD DONOR POPULATION IN TLEMCE

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Background: Blood transfusion is an essential substitutive therapy for many patients. To reduce the risk of infectious transfusion, WHO recommends the use of regular blood donors. However, these donors constitute a population at risk of anemia due to iron deficiency. This latter is not covered by almost of haemovigilance and iron deficiency donor systems.

Aims: The aim of the present study is a determination of the prevalence of the deficiency among donors of blood from Tlemcen, Algeria.

Methods: This analytical cross-sectional study concerns the 91 donors of whole blood. These were selected to perform a blood count and a dosage of ferritinemia. Statistic analyzes using SPSS software, Excel by applying the Pearson correlation and the chi² test.

Results: The prevalence of iron deficiency was 35.2%, anemia was 22%. Ferritinemia was strongly related to the different characteristics of the donation, mainly in women.

Summary/Conclusions: Haemovigilance systems focus their efforts on protection against iron deficiency. Unlike hemoglobin, serum ferritin remains the most sensitive and early marker for donor protection against this deficiency.

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P-575

ANALYSIS OF TRANSFUSION’S CURATIVE EFFECT OF AIHA PATIENTS WITH RBC AUTOANTIBODIES

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Background: For autoimmune hemolytic anemia patients with positive autoantibodies, the efficacy of blood transfusion is poor in patients with primary and secondary cross incompatibility.

Aims: To investigate the curative effect of RBC transfusion for AIHA patients with RBC autoantibodies

Methods: 32 cases of hematologic patients with positive DAT and positive RBC autoantibodies were collected and set as study group. 32 cases of routine transfusion patients with negative DAT results were set as control group. Parameters of Hb, RBC count and Hct of 24 h before and after transfusion in the two groups were detected and compared.

Results: The values of Hb, RBC count and Hct of the patients in study group showed no significant differences before and after transfusion (P>0.05). While the results of these parameters showed significant difference before and after transfusion in control group (P<0.05). Comparing the two groups, the indices of hemogram and transfusion effective rate were significant different (P<0.05).

Summary/Conclusions: RBC transfusion for patients with RBC autoantibodies is ineffective, and transfusion should only be applied when there is an indication. On the other hand, only in an emergency situation, patients with RBC autoantibodies may have RBC transfusion, which can maintain their Hb levels. They should not be refused transfusion because of the cross matching incompatibility.

P-576

ACUTE BLOOD TRANSFUSION REACTIONS IN A TERTIARY CARE HOSPITAL IN PAKISTAN– AN INITIATIVE TOWARDS HEMOVIGILANCE

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Background: Hemovigilance programs have been implemented in many countries and adverse events associated with blood transfusion are published in their annual reports. Pakistan has no established program at present.

Aims: In this study we report acute transfusion reactions at our hospital.

Methods: A cross sectional study was done and all adverse reactions that were reported to the blood bank was included from January 2014 to March 2016. An adverse response in the patient, related to administration of blood (within 24 h) was considered as immediate transfusion reaction.

Results: During the study period 20,956 blood and its components were issued. Total of 320(1.5%) adverse reactions were documented. The reactions reported were mainly allergic reactions, febrile non-hemolytic reactions, bacterial contamination, and acute hemolytic reactions. Allergic reactions were the most common adverse event and were observed in 15(46.8%) of the cases. Febrile non-hemolytic transfusion reaction was the second most common seen in 9(28%).

Summary/Conclusions: The low incidence indicates underreporting and the need for a formal hemovigilance system. International benchmarking between different medical systems is helpful to identify areas in the transfusion process, which have to be changed to improve transfusion safety.

P-577

ADVERSE REACTIONS AND LEUCODEPLETION IN THALASSAEMIA MAJOR PATIENTS

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Background: Blood transfusion is a life-saving intervention but can also cause adverse reactions in the recipients. The transfusion reaction surveillance systems as part of the national haemovigilance systems are not well established in Pakistan. The multi-transfused thalassaemia patients are particularly prone to develop these
EVALUATION OF QUALITY CONTROL OF BLOOD COMPONENTS AT OUR BLOOD BANK

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Background: Quality control is the backbone of quality assurance program. As part of it, quality control of blood components ensure availability of a sufficient supply of blood, its components of high quality with maximum efficacy and minimum risk to both donors and patients, hence, ensuring overall optimum safety of blood.

Aims: The objective of the study was to evaluate quality control of blood components preparation at our blood bank.

Methods: An observational cross sectional study was done at the blood bank of National Institute of Blood Disease and Bone Marrow Transplantation Karachi to analyze the quality control of blood components. Total 100 units of each blood component were randomly selected during this study period. Packed red cell units were lyze the quality control of blood components. Total 100 units of each blood component ensure availability of a sufficient supply of blood, its components of high quality with maximum efficacy and minimum risk to both donors and patients, hence, ensuring overall optimum safety of blood.

Aims: To estimate the prevalence and rate of transfusion reactions in thalassaemia patients and to assess the efficacy of leucocyte removal from packed red blood cells by Leucoat filters at the bedside.

Methods: This was a prospective multi-centre study carried out from Mar-Jul 2017, at three thalassaemia centres, i) Thalassaemia Centre, Shaheed Zulfiquar Ali Bhutto (SZAB) Medical University, Islamabad; ii) Sundas Foundation Thalassaemia Centre, Lahore; and iii) Fatimah Foundation, Lahore. A standardized patient haemovigilance reporting form developed by STP was used to collect the adverse reactions data. The selected patients were 70 thalassaemia patients who had history of frequent mild to moderate immediate transfusion reactions [febrile non-haemolytic reaction (30%) and allergic rashes (21%)]. Pre- and post-transfusion blood samples were collected for white blood cell count. Ethical approval of the study was granted by the Ethical Review Board of the SZAB Medical University. The clinical records and the reaction workup was done to rule out the haemolytic reactions. Statistical analyses were done through Microsoft Excel 2013.

Results: 70 Leucoat filters [by GLT Medical, Co. Ltd. China] were used during transfusion to selected 70 patients. These patients were routinely given pre-medication [Solus-Cortef (100 Mq) and Avel Injections] to avoid transfusion reactions, but with the filter use no pre-transfusion medications was given to observe the effectiveness of the leucoat filters. No haemolytic and delayed transfusion reaction was reported during the study. The age of transfused red cell concentrates ranged from 5–27 days [mean 13.39 days]. The pre- and post-filtration white blood cell counts showed an overall mean percentage of leucodepletion as 97.7%. None of the patients using filter developed the transfusion reaction.

Summary/Conclusions: Leucodepletion by using bedside filter is very effective for eliminating non-febrile transfusion reactions. In resource limited settings, leucoreduction using theuffy-coat method is also effective in reducing the transfusion reactions. Leucoreduction of blood components in thalassaemic patients is helpful in preventing transfusion reactions. Use of sub-standard filters needs to be regulated. This is an on-going study, leucoat filters will be used consistently on the thalassaemia and other chronic recipients [oncology and renal patients] to assess the effectiveness of leucodepletion and co-relate it with financial impact including prolonging duration of interval of transfusion.

P-578

CORRELATION BETWEEN TH1/TH2 CYTOKINES PRODUCTION AND TRANSFUSION REQUIREMENTS IN PATIENTS UNDERGOING ORTHOPEDIC SURGERY

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Background: Blood transfusion in the perioperative period has frequently been significantly associated with immunosuppression in patients after surgery. Moreover, mediating mechanisms underlying it are unknown. So confirm and minimize the possibility of blood transfusion may be important to improve prognosis for surgery patients.

Aims: This study aims to explore the relationship of transfusion requirement and the balance of Th1/Th2 cytokine in orthopedic surgery patients, which may benefit for future improvement of treatment.

Methods: We collected data for orthopedic patients received surgery. Plasma concentrations of several Th1 and Th2 cytokines (IL-2, -6, -10, TNF-α) were detected by enzyme-linked immunosorbent assay (ELISA), and then evaluated their clinical relevance to transfusion requirements.

Results: A total of 168 orthopedic surgery patients were recruited in this study. Overall, 36 patients (21.43 percent) received blood transfusion. Immunological analysis indicated that transfusion patients had significantly lower plasma concentrations of TNF-α (0.76 vs 1.67 pg/ml, P = 0.025), no significant concentration difference of IL-2, -6 and -10 were noted between two patient subgroups. Lower TNF-α

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expression induced a shift of Th1/Th2 balance toward Th2 dominance suggesting an immunosuppression result in blood transfusion requirement in perioperative period. Summary/Conclusions: Our findings indicated that transfusion requirements is associated with immunosuppression which contributes to poor prognosis in orthopedic patients.

P-581
TWO CASES OF AEL GENOTYPE IN OBSTETRICAL TRANSFUSION PREPARATION
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Background: There were 2 pregnant women in obstetrics specimens, who have discrepancy in the results of ABO blood typing.

Aims: To explore the significance of ABO subtype identification.

Methods: Blood samples were identified by gel microcolumn assay, conventional tube test, adsorption and elution tests and gene direct sequencing.

Results: In routine serological blood typing, the red cell typing of both pregnant women were O, whereas serum typing were A. In adsorption and elution tests, presence of A antigen was found on Ael red cell. Finally, the two pregnant women have been proved to be Ael04/002 and Ael01/002 by direct sequencing analysis. In obstetrics transfusion, O washed RBC and A plasma were the best choice when there wasn’t homo-blood donor.

Summary/Conclusions: Ael is a rare subtype of ABO blood type, characterized by the least amount of A antigen on the red cell and anti-A1 in the plasma. In routine serological blood typing, the blood cell always showed weak agglutination or no agglutination. In a result, the ABO typing was wrongly identified to be O, which bring the risk to patients in transfusion, especially in obstetrical and neonates department. When there were individuals with discrepancies in the results of ABO phenotyping, ABO genotyping is needed for an accurate evaluation of their blood type, in order to provide scientific basis for transfusion safety.

P-583
ANALYSIS ON GENETIC POLYMORPHISM OF HUMAN PLATELET ANTIGEN HPA1–6,15 SYSTEMS TO PLATELET TRANSFUSIONS
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Background: To study the genetic polymorphism of human platelet antigens in Zhejiang.

Aims: Understand the transfusion effect on platelet gene matching group in platelet transfusion.

Methods: Platelet antigen genotyping was performed by sequence-specific primer polymerase chain reaction (SSP-PCR) for the HPA-1-6,15 systems in 400 platelet donors and 54 patients of Zhejiang. The effectiveness of different platelet transfusion for 54 patients of platelet antibody screening positive.

Results: Among HPA-1-6,15 Systems, HPA-3 has the highest b gene frequency, its frequency is 0.51, HPA-15 has the highest heterozygosity, HPA-15b 0.33, others systems is mainly aa homozygous genotype, more than 90%. Platelet gene matching group has higher CCI and PPR than the group that receives random platelet group.

Summary/Conclusions: The effectiveness of patients transfusion gene matching platelet prevent from occurrence of platelet transfusion reactionlessness and improve the effective rate of transfusion.

P-582
COMPARISON OF THREE COMMERCIAL RED CELL GENOTYPING KITS
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Background: Genotyping of red cell antigens has potential benefits when compared to serological method. Genotyping is useful for rare blood group antigens, chronic transfused patients, patients with positive direct antiglobulin test, solving ABO discrepancy and evaluation risk of hemolytic disease of the fetus and newborn. However, some limitations still remain due to unknown or newly defined polymorphism or many allelic variants of blood group antigen which result in mistypings or discordant results with serological method.

Aims: To evaluate the efficiency in red cell genotyping of three commercial kits.

Methods: In this study during 2015 to 2017 a total of 40 samples from regular blood donors at National Blood Centre, Thai Red Cross Society were genotyped for red cell antigens using three commercial kits. Each kit used different methods and could genotype different number of red cell antigens. The commercial systems evaluated were Fluidic Microarray with Luminex (kit “A”, 37 antigens genotyped), bead-based BioArray with BioArray Solution machine (kit “B”, 15 antigens genotyped) and Mass Spectrometry with Mass Spectrometer machine (kit “C”, 47 antigens genotyped), respectively. From the genotype results, the predicted red cell phenotypes analyzed from software were then compared with red cell phenotypes using serological method.

Results: The predicted red cell phenotypes of Rh, Kell and Diego systems were all concordant when compared to serological method. In Kidd and MNS systems, only the results from kit “A” were concordant with serological method. But in the Duffy system, the results shown sample with a novel variant. For kit “B”, the results of MNS system were concordant with serological method but 5 DNA samples gave discordant results in Kidd system. Also the result of Duffy system due to limitation of the primers. For kit “C”, discordant results were due to S antigen and 5 samples for Kidd system. Interestingly, of the three kits tested, only kit “A” could detect Mi antigen which is important for our population.

Summary/Conclusions: The three commercial red cell genotyping kits had different limitation of primers, resulting in these discordant results. The selection of appropriate kit for red cell genotyped should be considered with local population in mind.

P-584
TO COMPARE THE CLINICAL EFFECT OF RESTRICTIVE BLOOD TRANSFUSION WITH THAT OF OPEN BLOOD TRANSFUSION DURING OPERATION
Z Huili and Z Yongyan
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Aims: To study the effectiveness of blood transfusion in platelet matching group in platelet transfusion.

Methods: Platelet antibody screening positive patients were divided into different groups and platelet gene matching group in platelet transfusion.

Results: Among HPA-1-6,15 Systems, HPA-3 has the highest b gene frequency, its frequency is 0.51, HPA-15 has the highest heterozygosity, HPA-15b 0.33, others systems is mainly aa homozygous genotype, more than 90%. Platelet gene matching group has higher CCI and PPR than the group that receives random platelet group. The effectiveness of patients transfusion gene matching platelet prevent from occurrence of platelet transfusion reactionlessness and improve the effective rate of transfusion.

P-585
PLATELET ANTIGEN HPA1–6,15 SYSTEMS TO PLATELET TRANSFUSIONS
Y Zhao
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Background: To study the genetic polymorphism of human platelet antigens in Zhejiang.

Aims: Understand the transfusion effect on platelet gene matching group in platelet transfusion.

Methods: Platelet antigen genotyping was performed by sequence-specific primer polymerase chain reaction (SSP-PCR) for the HPA-1-6,15 systems in 400 platelet donors and 54 patients of Zhejiang. The effectiveness of different platelet transfusion for 54 patients of platelet antibody screening positive.

Results: Among HPA-1-6,15 Systems, HPA-3 has the highest b gene frequency, its frequency is 0.51, HPA-15 has the highest heterozygosity, HPA-15b 0.33, others systems is mainly aa homozygous genotype, more than 90%. Platelet gene matching group has higher CCI and PPR than the group that receives random platelet group. Summary/Conclusions: The effectiveness of patients transfusion gene matching platelet prevent from occurrence of platelet transfusion reactionlessness and improve the effective rate of transfusion.

Abstract has been withdrawn

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Cellular Therapies
Stem Cell and Tissue Banking, Incl. Cord Blood

P-586
THE COMPARATIVE STUDY OF THE INTERVENTION OF THE MOUSE BRAIN INFARCTION MODEL IN TWO STATES OF THE UMBILICAL CORD BLOOD

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Background: Human umbilical cord blood mesenchymal stem cells can repair the injury of nerve cells caused by ischemia and hypoxia, but which state of cells has a better treatment effect: primary isolation or induced differentiation is not yet known.

Aims: Two kinds of cells were treated respectively through the animal model, and the curative effect was evaluated by behavior, histology and molecular biology, and find the best state of cell therapy

Methods: The separation of quadruple bags by means of density gradient centrifugation in vitro culture and differentiation of human umbilical cord blood mesenchymal stem cells; construct the rat model of cerebral infarction; experimental animal groups for cell therapy, balance beam test in rats balance and motor coordination; the ability of learning and memory in the water maze test in rats with spatial localization; TTC staining cell calculation 144 after treatment of cerebral infarction volume; rats survival cerebral infarction area week neurons Nissl staining; GFAP immunohistochimical staining of reactive astrocytes were observed after treatment; CD34 immunohistochimical staining was used to observe the angiogenesis after treatment; Ki-67 immunohistochimical staining was used to observe the effect of cell therapy on cell proliferation. ELISA method was used to determine the secretion of inflammatory factors IL-1 β, IL-6, and TNF-β 14 days and 60 days after cell treatment

Results: The isolated cells of MRI detection model the balance beam test and balance beam walking test results showed that cerebral infarction in rats induced by cell therapy group, balance ability and walking ability improved the water maze test results showed that the rats spatial orientation ability and the ability of learning and memory, learning ability is better than the induction group the primary observation group, 144 infarct volume. TTC staining: induction group and primary group were 42.39 ± 2.91% and 45.66 ± 5.23% and Nissl staining neurons survival induced by cerebral infarction group center than the primary group significantly reduced tissue edema process Reduce the number of cells decreased; the hippocampus is not obvious, the arrangement of relatively neat immunohistochimical detection of CD34, GFAP in induced group high expression, low expression of GFAP and ELISA in the brain tissue of inflammatory factor IL-1 beta, IL-6, the expression of TNF- in 60 days when IL-1 β, TNF- β, IL-6 in treatment group induced low expression.

Summary/Conclusions: Ectomesenchymal cells umbilical cord blood can relieve cerebral infarction infraction area in rats model of infarction, promote the regeneration of the infarction area microcirculation blood vessels and cells, cells induced by culture, the intervention of the effect is better than that of the original generation group.

P-587
Abstract has been withdrawn

P-588
Abstract has been withdrawn

Cellular Therapies
Storage and Release

P-589
THE CREATION OF AN UNRELATED DONORS BONE MARROW REGISTRY IN PAVLOV FIRST SAINT-PETERSBURG STATE MEDICAL UNIVERSITY

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Background: Allogeneic stem cell transplantation (alloHSCT) is an effective method for the treatment of hematological malignancies, hematopoiesis insufficiency, inherited diseases and some solid tumors. Demand for alloHSCT in Russian Federation in children and adults is more than 4 000 cases per year. Due to low fertility levels in Russia, for only 10–15% of Russians can an identical HLA related donor be found. The subsequent search for an unrelated donor can be carried out using the online platform BMDS Search & Match Services. However, for only 80–85% of Russians can an HLA-compatible unrelated donor be found in the international database, largely in connection with the polymorphism of the population of Russian Federation. In this light, there are clear prerequisites for the creation and development of a unified Union of independent States (CIS) registry of bone marrow donors, which would increase the availability of alloHSCT for citizens of Russia and the CIS.

Aims: To increase the efficiency of successful searches for and activation of unrelated bone marrow donors in Russian registers by creating an online search platform – ’Bone Marrow Donor Search’ (BMDS, www.dmds.info).

Methods: Since 2012, the BMDS online search platform has been in development at the Raisa Gorbacheva Memorial Institute for Children’s Oncology, Hematology and Transplantation, which, together with other specialized public health institutions, has been incorporating its implementation into clinical practice. Currently, the BMDS includes anonymized data from approximately 60 000 HLA-phenotypes of potential bone marrow donors from 13 Russian and Kazakh bone marrow donor registries.

Results: From November 2012 to April 2017 in various Russian and Kazakh transplant centers 144 cases of alloHSCT were performed from an unrelated donor found in the Russian registers. 88.2% cases were fully compatible – a 10/10 match for the 5 HLA genes loci between donor–recipient; in 11.8% of cases, the match was partially compatible – 9/10. Full compatibility of system AB0 erythrocyte antigens was noted in 20.6% of the cases. The content of CD34+ in the graft was 1.2–12.0 x 106, 9/10. Full compatibility of system AB0 erythrocyte antigens was noted in 20.6% of the cases. The content of CD34+ in the graft was 1.2–12.0 x 106, median 5.0 x 106. Engraftment was observed in 79.4% of the cases.

Summary/Conclusions: The use of the BMDS online platform increased the efficiency of searches for unrelated HLA-compatible donors in Russian registers for patients in the Russian Federation and the CIS. Further development of the donor base and the inclusion of newly created bone marrow donor registries will further improve the effectiveness of searches for an unrelated donor in Russia, and reduce the time and associated financial costs.

P-590
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P-594
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P-595
REVIEW OF TECHNICAL ASPECTS OF PERIPHERAL BLOOD STEM CELL COLLECTION IN PEDIATRIC DONORS: OUR EXPERIENCE
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Background: Pediatric Peripheral Stem Cell collection has purported to be a modal-
ity of treatment in many malignant and non-malignant conditions.

Aims: The aim of this study was to review the technical aspects related to Pediatric PBSC collection including vascular access, flow rate, anti-coagulation, calcium replacement and blood volume processed.

Methods: This was a retrospective observational review of 34 PBSC procedures done in 31 children less than 16 years for various indications. Informed consent was taken from respective guardians. Mobilization was attempted with G-CSF and Plerixa-
for was added if there was a failed mobilization with G-CSF. Pre-procedure CD34 count was carried out & apheresis was commenced only if peripheral blood CD34 count was ≥ 20/µl. Femoral venous access was selected with HD triple lumen central venous catheter using mild sedation with Ketamine +/− Midazolam according to hos-
pital guidelines by Pediatric consultant. All procedures were done in ICU under con-
tinuous bedside monitoring. COM.TEC (Fresenius- Kabi) cell separator equipment
was used with P1YA kit and continuous Calcium Gluconate infusion was used in all cases. RBC priming was done when required

Results: Of the 31 Pediatric donors (F:M; 20:11) the mean age was 99.5 months
with youngest being 13 months old. 16 (51.6%) donors were males. 20 (64.5%) donors had a body weight of < 25 kg. The average
pre-procedure TNCC was 48.52 × 10^3/µl (23.1 to 95.7 × 10^3 /µl). The average
pre-procedure CD34 count was 87.15/µl, slightly lower for female donors (86.02/µl) but the difference was not significant. Highest mobilization of CD 34 cells was seen in children aged less than 5 years (123.7/µl) The average volume processed was 5900 ml. Average TNCC &CD 34 of product was 237.58 x 10^3/ul & 1019.32 x 10^3/ul, & was slightly
higher for females (1050.72/µl & 1377.98/µl respectively. Average hematocrit & Platelet counts of the collected product were
15.7%, & 18 x 10^9/µl respectively. In 28 (90.32%) single procedure was done and only in 3 donors it was done twice. The average dose administered was 5.79 × 10^9/kg with average engraftment time for neutrophils was 14.88 days (11-7 days) while for pla-
telets it was 14.58 days (9-30 days).

Summary/Conclusions: For pediatric PBSC extractions, we recommend a triple lumen HD catheter preferably Femoral as it is less prone to complications. As ECV is an important factor, in children with low TBV, red cell priming should be addition-
ally done with cross matched, irradiated, leucodepleted RBC (< 5 days collection).

ACD-A is a preferable anticoagulant as it lacks systemic side effects of heparin. Moreover, the only known commonest complication of fresh RBC toxicity can be well taken care of by continuous calcium infusion based on pre-processed ion-
ized calcium levels. Volume per cycle is an important determinant, if low it leads to more number of cycles being processed for the same volume of whole blood thereby increasing the product volume, RBC and platelet contamination & increased DMSO requirement for cryopreservation. Blood Flow rates should be kept optimum around
1 ml / kg to avoid complications. Recruitment of progenitor cells may be age-speci-
fic and hence more predominant in younger children than in their older counter-
parts.

P-596
PRELIMINARY COMPARISON OF THE IMPACT OF PBMC COLLECTION ON BLOOD DONORS AND COLLECTION EFFICIENCY BETWEEN 5 DIFFERENT BLOOD CELL SEPARATORS
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Background: In anti-tumor immunotherapy, DC is the most powerful antigen pre-
senting cell. DC is widely distributed in vivo, but less in number (only about 3% of
peripheral blood mononuclear cells, PBMC, DC) can be induced from CD34 + cells or
monocytes and proliferate. The adherent mononuclear cells in peripheral blood were
used as precursor cells of DC, and higher purity DC could be obtained by cytokine
induction. Ficoll liquid separation is the traditional method which is mainly used for small
amount of blood, while small amount of PBMC is difficult to meet the needs of clinical
therapy. Large amount of blood has to be divided into many centrifuge tubes, repeated
open operation increase the chance of contamination. Nowadays, the technology of blood cell separator is very advanced. Collection of blood components has been automated and applied to various fields of clinical prac-
tice. Blood separator can also be used to collect PBMC from large amount of periph-
eral blood. In this study, PBMC cells from healthy donors were collected by different
blood cell separators, and then the DC cells were cultured in vitro.

Aims: This study aims to compare the effects of the collection of peripheral blood
mononuclear cells (PBMCs) using five types of blood cell separators, and investigate
changes in donors’ blood-related indicators.

Methods: The PBMCs of 60 healthy donors were collected using five types of blood cell
separators, including MCS+, Amicus, COBE, COM.TEC and OPTIA. Blood routine
blood test was conducted on donors before and after the collection, and was also con-
ducted on the final collection of products. The collection effects of these separators
were analyzed by comparing collection efficiency, product content, the amount of
collected circulating blood, and product contamination. The collection effects of these
separators and their influences on the donors were discussed.

Results: The amount of collected PBMCs (×10^9) in the five groups was
4.11 ± 1.58, 6.61 ± 2.22, 6.00 ± 1.79, 5.77 ± 2.07, and 5.67 ± 1.99, respectively.

The decrease value of Ptit (×10^9) was 95.58 ± 40.90, 16.83 ± 19.05, 66.83 ±
43.47, 54.67 ± 18.32, and 39.92 ± 17.94, respectively. Furthermore, collection
efficiency was 0.50 ± 0.13, 0.43 ± 0.11, 0.48 ± 0.12, 0.50 ± 0.09, and
0.54 ± 0.13, respectively.

Summary/Conclusions: Understanding the impact of different blood cell separators
on the donors, as well as its collection efficiency and product contamination rate,
and assessing these before collection, would contribute to improving the collection
quality of PBMCs. Enough PBMCs can be collected using all five blood cell separa-
tors, which meets culturing requirements and clinical treatment requirements. In
addition, the collection process is safe and effective for donors.

P-597
COMPARISON OF IN VITRO CHARACTERISTICS OF PLATELETS STORED IN REFRIGERATED WITH A COMMERCIAL PLATELET ADDITIVE SOLUTION CONTAINING N-ACETYLGLYCINE OR VITAMIN C
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Background: Because of the potential risk of bacterial contamination, platelets have
a very short shelf life of 5 days stored at 20–24°C. So, there have been many trials
storing platelets in refrigerated or frozen, but cold-stored or frozen-thawed platelets
after transfusion have known cleared rapidly by hepatic macrophages or hepatocytes. We need platelets circulating in vivo for long days, having a long shelf life,
not contaminated by bacteria.

Aims: We developed and evaluated platelets stored in refrigerated with platelet
additive solutions (PAS) containing antioxidants such as N-acetylcysteine (NAC),
vitamin C.

Methods: In the study, 50 mS NaC or 100 mS vitamin C mixed in PAS (80 mS
sodium chloride, 30 mS sodium acetate, 10 mS sodium citrate, 5 mS potassium chloride, 3 mS magnesium chloride, 26 mS sodium phosphate) added to refrigerated
platelets. Prepared platelet-rich plasma (PRP) was stored at either room temperature

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P-599
FIRST EXPERIMENTAL FACTOR IN THE PBMC COLLECTION QUANTITY USING DIFFERENT BLOOD CELL SEPARATOR
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Background: In anti-tumor immunotherapy, DC is the most powerful antigen presenting cell. DC is widely distributed in vivo, but less in number (only about 1% of peripheral blood mononuclear cells, PBMC). DC can be induced from CD14+ cells or monocytes and proliferate. The adherent mononuclear cells in peripheral blood were used as precursor cells of DC, and higher purity DC could be obtained by cytokine induction. Ficol liquid separation is the traditional method which is mainly used for small amount of blood, while small amount of PBMC is difficult to meet the needs of clinical treatment. Large amount of blood has to be divided into many centrifuge tubes, repeated open operation increase the chance of contamination. Nowadays, the technology of blood cell separator is very advanced. Collection of blood components has been automated and applied to various fields of clinical practice. Blood separator can also be used to collect PBMC from large amount of peripheral blood. In this study, PBMC cells from healthy donors were collected by different blood cell separators, and then the DC cells were cultured in vitro.

Aims: To collect healthy donors’ PBMC with 5 different blood cell separators including Amicus, COM.TEC, Cohr Spectra, MCS+, and Spectra Optia. 12 donors were treated as a group and for each group a type of blood cell separator was used. The donors are all regular unpaid blood donors who donate platelets every 15 days.

Viability of cells on the day, regarded as qualified for culture, the number of active DC must be no less than 1 10⁹. The donors are all regular unpaid blood donors who donate platelets every 15 days.

Methods: The influence of 13 factors on the collection of PBMCs were investigated, including blood donor weight, platelet quantity, blood donor body weight, collection cycle, collection time, the amount of pre-collection white blood cells, the amount of pre-collection red blood cells, the hematocrit of pre-collection red blood cells, pre-collection hemoglobin content, amount of pre-collection platelets, absolute amount of pre-collection lymphocytes, absolute amount of pre-collection monocytes, and absolute amount of pre-collection mononuclear cells.

Summary/Conclusions: PBMC can be collected effectively and safely by blood cell separator, and the viability of DCs in vitro cultivation was acceptable. For DC culture, the absolute amount of pre-collection lymphocytes of donors should be given attention. For the Optia blood cell separator, the absolute amount of pre-collection lymphocytes of donors should be given attention. For the COM.TEC blood cell separator, the absolute amount of pre-collection lymphocytes of donors should be given attention. For the Optia blood cell separator, the absolute amount of pre-collection lymphocytes of donors should be given attention.
P-601
THE RECOVERY OF DONORS’ BLOOD ROUTINE INDEX AFTER PBMC APHeresis WITH BLOOD SEPARATORS
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Background: In anti-tumor immunotherapy, DC is the most powerful antigen presenting cell. DC is widely distributed in vivo, but less in number (only about 1% of peripheral blood mononuclear cells, PBMC). DC can be induced from CD34+ cells or monocytes and proliferate. The adherent mononuclear cells in peripheral blood were used as precursor cells of DC, and higher purity DC could be obtained by cytokine induction. Ficoll liquid separation is the traditional method which is mainly used for small amount of blood, while small amount of PBMC is difficult to meet the needs of clinical treatment. Large amount of blood has to be divided into many centrifuge tubes, repeated open operation increase the chance of contamination.

Nowadays, the technology of blood cell separator is very advanced. Collection of blood components has been automated and applied to various fields of clinical practice. Blood separator can also be used to collect PBMC from large amount of peripheral blood. In this study, PBMC cells from healthy donors were collected by different blood cell separators, and then the DC cells were cultured in vitro.

Aims: To compare the changes of routine blood test results in healthy volunteers after the collection of peripheral blood mononuclear cells with five different blood cell separators.

Methods: 12 healthy volunteers were collected the peripheral blood mononuclear cell respectively. Using five kinds of blood cell separators Amicus, Com.tec, Mcs plus, COBE and Optia the blood to do the routine blood test before the collection, after the collection 2 weeks and after the collection 4 weeks and observe the changes after the collection.

Results: There is no obvious variation of the blood cells count before and after collection in 4 weeks. There is no obvious variation of the blood cells count before and after collection in 2 weeks except the WBC. And there is no obvious variation of the blood cells count before and after collection in 4 weeks.

Summary/Conclusions: The test of white blood cells from volunteers shows that the figures of the two-weeks interval group are higher than themselves before the collection. While the figures are still fluctuate within the normal range, and the 4-weeks interval has less effect on the healthy volunteers.

P-602
IMPACT OF DIFFERENT PRESERVATION CONDITIONS ON THE APOPTOSIS RATE OF PBMC COLLECTED BY BLOOD SEPARATOR
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Background: In anti-tumor immunotherapy, DC is the most powerful antigen presenting cell. DC is widely distributed in vivo, but very few in number (only about 1% of peripheral blood mononuclear cells, PBMC). Recently, several clinical trials have reported some promising benefits of using the CAR-T cell therapy in the treatment of a variety of cancers. PBMC cells can serve as the source of T cells for CAR-T cell therapy. DC is widely distributed in vivo, but very few in number (only about 1% of peripheral blood mononuclear cells, PBMC). DC can be induced from CD34+ cells or monocytes and proliferate. The adherent mononuclear cells in peripheral blood were used as precursor cells of DC, and higher purity DC could be obtained by cytokine induction. Ficoll liquid separation is the traditional method which is mainly used for small amount of blood, while small amount of PBMC is difficult to meet the needs of clinical treatment. Large amount of blood has to be divided into many centrifuge tubes, repeated open operation increase the chance of contamination.

Nowadays, the technology of blood cell separator is very advanced. Collection of blood components has been automated and applied to various fields of clinical practice. Blood separator can also be used to collect PBMC from large amount of peripheral blood. In this study, PBMC cells from healthy donors were collected by different blood cell separators, and then the DC cells were cultured in vitro.

Aims: To study the optimum condition to preserve PBMC collected by blood cell separator. Different storage conditions refer to the combination of different temperature and different storage time. The purpose of the study is to find the best preservation time and temperature.

Methods: To collect 12 healthy donors’ PBMC with Spectra Optia cell separator using MNC program. The donors range from 27 to 56 years old, including 8 men and 4 women. They are all regular unpaid blood donors who donate platelets every 15 days. Circulating blood volume was between 5 and 8 liters. Collecting time was between 2 h and 3 h. Mobilizers were not used. The final PBMC product volume was between 100 ml and 115 ml. The number of PBMC cells was between 1.8 108 and 4.9 109. We took 6 ml from the product and divided it into 6 equal parts. 3 samples were preserved at 4°C and the other three at 22°C. After 5 h, two samples were took out, each of 4°C and 22°C. Apoptosis ratio of PBMC were analyzed by flow cytometry (FascAria II, BD). Then at 18 h, and finally at 28 h. Anti-CD5+ antibodies were used to mark total PBMC, anti-CD14+ antibodies labeled T lymphocytes, and anti-CD14+ antibodies labeled monocytes. The apoptosis ratio of different kinds of cells was detected by 7AAD. All reagents were purchased from BD company.

Results: Taking monocytes as an example, the mean apoptotic ratio was 4.9 ± 1.3% (4°C) and 3.3 ± 0.5% (4°C), 4.1 ± 1.6% (4°C) and 4.0 ± 1.2% (22°C), respectively. As for T lymphocytes, the apoptosis ratio was always higher than 4°C. And after 28 h this feature was more obvious. The apoptosis ratio of 4°C preservation grew slowly while at 22°C grew rapidly. Under the same condition, the apoptosis ratio of monocytes was always higher than T lymphocytes.

Summary/Conclusions: Compared with 22°C, 4°C was better for PBMC preservation. Under 4°C, the average apoptosis ratio of PBMC remained within 5% at 28 h.

P-603
ANALYSIS OF BLOOD NUCLEIC ACID DETECTION IN CHANGSHA AREA
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Background: Blood related infectious diseases prevention and control has been the focus of world attention, select the appropriate detection technology can effectively improve blood safety. This paper reviews the nucleic acid testing (NAT) in the application of blood screening.

Aims: By analyzing the nucleic acid results of blood donors in Changsha, the significance of the nucleic acid testing (NAT) in blood screening was discussed.

Methods: 1) First of all, the samples of blood donors were tested two times of HBsAg, anti-HCV and anti-HIV by ELISA method; 2) Using Roche nucleic acid or KELONG blood screening system, mixed samples were tested for HBV-DNA, HCV-RNA, and HIV-RNA; 3) Mixed inspection reactive samples were split test.

Results: The results showed that in January 2017-June 2017, 7309 samples were tested in Changsha blood center, 84 pools positive and 41 specimens split positive (all of which were positive for HBV-DNA), and the resolution rate was 48.81% (41/84).

Summary/Conclusions: Therefore, the testing of blood nucleic acid can effectively reduce the risk of blood transfusion, and ensure the safety of the blood.

P-604
THE CHANGE OF BLOOD DONORS’ ELECTROLYTE CONCENTRATION AFTER PBMC APHeresis WITH DIFFERENT BLOOD SEPARATORS
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Background: In anti-tumor immunotherapy, DC is the most powerful antigen presenting cell. DC is widely distributed in vivo, but less in number (only about 1% of peripheral blood mononuclear cells, PBMC). DC can be induced from CD34+ cells or monocytes and proliferate. The adherent mononuclear cells in peripheral blood were used as precursor cells of DC, and higher purity DC could be obtained by cytokine induction. Ficoll liquid separation is the traditional method which is mainly used for small amount of blood, while small amount of PBMC is difficult to meet the needs of clinical treatment. Large amount of blood has to be divided into many centrifuge tubes, repeated open operation increase the chance of contamination.

Nowadays, the technology of blood cell separator is very advanced. Collection of blood components has been automated and applied to various fields of clinical practice. Blood separator can also be used to collect PBMC from large amount of peripheral blood. In this study, PBMC cells from healthy donors were collected by different blood cell separators, and then the DC cells were cultured in vitro.

Aims: Make comparisons of blood donors’ electrolyte concentration between three time points: before PBMC apheresis, 15 min after PBMC apheresis, and 2 weeks after PBMC apheresis.
Methods: To collect healthy donors’ PBMC with 5 different blood cell separators including Amicus, COMTEC, Cobe Spectra, MCS+, and Spectra Optia. 12 donors were treated as a group and for each group a type of blood cell separator was chosen. The donors are all regular unpaid blood donors who donate platelets every 15 days. Circulating blood volume was between 5 and 9 liters. Collecting time was between 2 h and 3 h. Mohilizers were not used.

Electrolyte concentration of blood donors was detected at three time points: before apheresis, 15 min after apheresis and two weeks after apheresis. And then the data was compared. Results: The data of 15 min after apheresis indicated that, concentration of blood K+ and blood Cl− decreased significantly after the collection (P < 0.05), while there was no obvious change of blood Na+ concentration (P > 0.05).AS for the data of two weeks after apheresis, there was no obvious difference compared with the data detected before apheresis. This indicated that the electrolyte concentration of the blood donors had recovered after two weeks.

Summary/Conclusions: After PBMC apheresis, there was a transient reduction of the donors’ blood K+ and blood Cl− electrolyte concentration. Appropriate intervention prior to apheresis or corresponding treatment after apheresis was necessary. Two weeks after PBMC apheresis, the electrolyte concentration of the blood donors had recovered. This proved that collecting PBMC with blood separator was safe.

Clinical Applications

P-605
CD8+FOXP3+REGULATORY T CELLS DERIVED EXOSOMES AND THEIR POTENTIAL ROLES IN THE IMMUNE MODULATION

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Background: Exosomes are defined as a type of membrane vesicles secreted into extracellular space by most types of cells and are reported to involve in varies kinds of biological process. Human peripheral blood CD8+FOXP3+ Tregs cells are reported to play important role in immune-modulation. Aims: To isolate the CD8+CD103+ Tregs derived exosomes and investigate their functions in CD8+T cells mediated immune-modulation. Methods: CD8+ T cells were freshly purified from PBMCs, cultured with anti-CD3/CD28 antibody packaged beads and IL-2, and then cultured in the Treg polarizing condition with TGF-beta and rapamycin. The harvest cells were co-cultured with dendritic cells stimulating CD4+CD25+ effector cells in the transwell plate. The supernatant derived from CD8+Tregs was collected and ultrafiltered by centrifugation and the remaining solution was precipitated with PEG. The harvest precipitation was used for electro precipitate analysis. Western blot experiments confirmed the expression of those exosome surface markers CD63, TSG101. Besides, transmission electron microscope analysis demonstrated a kind of round-shaped membrane vesicle as more stable regulatory cells with greater inhibition effects. However, CD8+FOXP3+Tregs derived exosomes and their functions involved in CD8+Tregs mediated immune-modulation were seldom reported.

Results: As compared with direct contact co-culture, separated CD8+Treg cells could suppress the proliferation of effector cells with a small decline (P > 0.05), which means some non-contact factors involved in the CD8+ Treg mediated immune modula- tion. A total number of 4.57 × 10⁷ cells exosomes were harvest. Electro precipitate analysis demonstrated a kind of round-shaped membrane vesicle 50-150 nm in diameter (145.1 ± 6.7 nm by NTA). Western blot experiments confirmed the expression of those exosome surface markers CD63, TSG101. Besides, TGF-beta and NOX2 were also expressed on CD8+FOXP3+Treg derived exosomes. Compared with their IL-2 induced effector CD8+ counterparts, CD8+Treg derived exosomes contained higher levels of miR-155, let-7b and let-7d (P < 0.05). And the addition of CD8+ Treg cells derived exosomes demonstrated a dose-depend inhibition on the proliferation of CD4+ effector cells.

Summary/Conclusions: Extracellular vesicles ranged in 50-150 nm diameter were secreted by CD8+CD103+Treg cells and those exosomes could involve in CD8+ Treg mediated immune modulation.

P-606
RNA-SEQ-BASED GENE EXPRESSION PROFILING OF MEGAKARYOCYTES FROM HUMAN CORD BLOOD CD34+ CELLS EX Vivo EXPANDED IDENTIFIES NEW TRANSCRIPTION REGULATORS OF MEGAKARYOPOIESIS

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Background: Megakaryocytes (MKS) are the sole progenitors for platelets. The processes of differentiation and platelet formation from megakaryocytes still remain to be elucidated. While some key megakaryocytic transcription factors (TFs) have been identified, the complete network of megakaryocytic transcriptional control is poorly understood.

Aims: To understand cellular mechanism in the megakaryopoiesis, using RNA-Seq technology we examined the mRNA level of transcriptional regulators in megakaryocytes derived from human cord blood CD34+ hematopoietic cells. Methods: CD34+ cells were isolated using density gradient centrifugation and magnetic activated cell sorting (MACS). Cultures were stimulated with only recombinant human TPO (100 ng/ml). After 7, 14 and 18 days, the MK fraction was selected by immunomagnetic sorting from the non-MK fraction using an anti-CD41a monoclonal antibody. RNA-Seq-derived gene expression data was performed on uncultured samples (day 0), cultured but unselected samples (days 7), and cultured, selected samples (days 14, 18 days) by using the next-generation sequencing (NGS) platform. RT-PCR and immunofluorescence were used to verify the expression of transcription factors. Results: The transcriptional kinetics of most known megakaryocytic transcription factors have been identified including GATA1, FLI1, and MAFF. 9 genes were upregulated specifically in MK cells compared with CD34+ cells and unselected early cells. Most of these upregulated TFs either have not previously been associated with megakaryopoiesis or their role in the MK lineage remains ambiguous. These include MBD1, MEF2C, BACH1, which are strongly upregulated in MK cells. Protein expression and nuclear localization were confirmed in megakaryocytic cells for three of the novel candidate megakaryocytic transcription factors.

Summary/Conclusions: This study reveals a global gene expression profile of in vitro human CB-derived megakaryopoiesis. Some of these genes may play regulatory roles during the development of CB-derived megakaryopoiesis. Our observations may help to expand our understanding of transcriptional regulation in megakaryocytic differentiation of stem and progenitor cells.

P-608
ALPHA-DYSTROGLYCAN PLAYS IMPORTANT ROLES IN PLATELET AGGREGATION AND HEMOSTATIC PLUG FORMATION

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Background: Fibrinogen and von Willebrand factor (VWF) have been considered essential for platelet adhesion, aggregation and hemostatic plug/thrombus formation. However, it has been shown that platelets lacking fibrinogen, and even lacking both fibrinogen and von Willebrand factor (VWF), can still aggregate in vitro and in vivo. Suggesting other unidentified proteins can mediate platelet aggregation and platelet plug formation independent of fibrinogen and/or VWF. Through screening published platelet proteomics data, we identified a potential candidate, alpha-dystroglycan (α-DG). α-DG is a glycoprotein found in the dystroglycan complex, which bridges the intracellular actin cytoskeleton with extracellular matrix proteins like laminin. Despite vast reporting on the role of α-DG and the dystroglycan complex in myocytes, its role in platelet aggregation and hemostasis remains to be explored. Hence, we hypothesize that additional proteins, such as alpha-dystroglycan (α-DG), are involved in platelet aggregation and hemostatic plug formation.

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Aims: To identify whether α-DG contributes to platelet adhesion, aggregation, and hemostatic plug formation.

Methods: Flow cytometry and western blotting were used to assess the expression of α-DG on platelets. Light transmission aggregometry was used to investigate the effect of α-DG blocking antibodies on platelet aggregation in both platelet-rich plasma and washed platelets with a variety of agonists. A murine laser-injury intravitreal microscopy was used to evaluate the effect of anti-α-DG antibodies within flowing blood in vivo. Collagen-coated perfusion chambers were used to study anti-α-DG antibodies in human blood under flowing conditions. The effects of anti-α-DG antibodies on the viscoselastic properties and kinetics of coagulation were assessed using thromboelastography.

Results: We found α-DG was expressed on the surface of human and murine platelets (resting and activated). Using light transmission aggregometry, we observed that a polyclonal antibody against full length α-DG markedly inhibited platelet aggregation in both platelet-rich plasma and gel-filtered platelets. To localize the specific functional domains on α-DG that contribute to platelet aggregation, an α-DG N-terminus polyclonal antibody was employed and a similar decrease in platelet aggregation was observed. Furthermore, a monoclonal antibody specific to the N-terminus laminin binding site in α-DG was able to inhibit platelet aggregation, suggesting an important role of the laminin binding site in mediating hemostasis. We performed intravitreal microscopy with vessels of the mouse cremaster muscle using a laser injury model and found that injection of the polyclonal antibody against α-DG into mice decreased the growth of thrombi, which were consistently washed away after platelet plug formation (embolization) at the site of injury. Preliminary data showed that the α-DG polyclonal antibody decreased clot strength and inhibited human platelet adhesion and aggregation in collagen coated perfusion chambers.

Summary/Conclusions: α-DG is a novel protein that plays a functional role in platelet aggregation and hemostatic plug formation. The interactions between the N-terminus of α-DG with platelet receptor(s) and/or sub-endothelial matrix proteins are currently under investigation.

P-609 PRELIMINARY RESULTS OF HLA-TypING IN DONORS AND RECIPIENTS

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Background: Organ transplantation and hematopoietic stem cell transplantation (HSCT) often are the main methods of treatment for patients with end-stage renal, hepatic and cardiac failure, malignancy, and hematological and hereditary diseases. In the Republic of Tajikistan, more than 500 patients are in need of kidney transplantations per year, HSCT – about 100 patients, liver transplants – more than 200 patients, and other organs. However, during any given year only a few dozen of these patients are able to receive kidney and liver transplants. HSCT is performed in foreign clinics for a limited number of patients, and there the main limiting factor is the absence of HLA-compatible donors due to ethnic and genetic features. In organ and HSCT, the fact of graft engraftment and rejection is determined by the degree of biological compatibility between donor and recipient. The median time before transplant rejection in full HLA-compatible allogeneic relative transplantation is 22.4 years and 4.6 years in allogeneic organ transplantation.

Aims: To determine HLA typing in donors and recipients amongst a sample drawn from the Republic of Tajikistan.

Methods: HLA class I [A and B] phenotype identification was performed in lymphocyte suspension with the complement-dependent lymphocytotoxic test in the Terasaki microplates (Gisans, St. Petersburg). For molecular genetic typing of HLA class I and II antigens in blood samples PCR-SSP method was used, which is based on polymerase chain reaction using sequence-specific primers with PROTRANS kits (Germany). Also, HLA system antibodies (sensitization index) identification and cross-match tests for tissue antigens between donors and recipients were performed.

Results: Obtained results showed that genes A2, A11, A1, A3 dominate in the HLA-A locus. Genes A19, A23, A24, A26, A32, A31, A36 and others are less often detected. Genes B15, B13, B51, B49, B17, B14, B38, B12 were found predominantly in HLA-B locus. Genes B7, B8, B11, B15, B16, B18, B22, B40, B41, B60, B61 were detected much less often. Most European peoples have a dominance of the genes A1, A2, A3, B7 and B15. Comparative analysis shows a significant difference in genes between the citizens of the Republic of Tajikistan in comparison with Europeans, especially at the loci B. DRB1*03, DRB1*13, DRB1*04, DRB1*15 genes predominate among locus DRB1*08. The remaining genes (DRB1*09, DRB1*11, DRB1*09, DRB1*14, DRB1*08 and others) are less frequently detected and only in single cases. Citizens of European countries mainly have genes DRB1*04, DRB1*07, DRB1*08, DRB1*10, DRB1*11, DRB1*12, DRB1*14, DRB1*16, DRB1*18. The results of anti-HLA antibodies search were positive in 18.2% of recipients, and the results of cross-match with donor lymphocyte samples were positive.

Summary/Conclusions: There are a number of differences in the distribution of HLA antigens among the population of the Republic of Tajikistan in comparison with Russian Federation, the Republic of Kazakhstan and European countries. The level of HLA-incompatibility underlines the need for the creation of a national register of typed donors.

P-610 Abstract has been withdrawn

P-611 IDENTIFICATION OF MITOXANTRONE DIHYDROCHLORIDE AS AN ANTI-HSV COMPOUND

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Background: HSV is one of the most prevalent human pathogen that causes of oral-labial infection, urogenital lesions and life-threatening encephalitis. There are some antiviral medicines with activity against HSV-1 and HSV-2, however, more and more evidences show that the incidence of drug resistance is increasing. Aims: The aim of our study was to identify new anti-HSV compound with potential use for further drug development.

Methods: We screened a chemical library of around 1500 compounds to identify inhibitors of HSV-1 induced toxicity. Cell was pretreated with compounds and their viability was determined by measuring ATP levels to reflect the inhibition effect against HSV-1 induced necrosis. Viral titers were determined by plaque assay. Further experiments including western blot analysis, qPCR analysis and Lucifase assay were performed to explore the antiviral mechanism of the compounds.

Results: Here, we identified a small molecular, mitoxantrone dihydrochloride (henceforth MD) with potency against HSV-1-induced death. Viral titers and the GFP-labeled HSV-1 were potently reduced by pretreatment of MD in both human and mouse cell lines. Moreover, MD efficiently blocked the expression levels of viral proteins in various cells. Notably, MD inhibited the expression of immediate-early gene ICP0, ICP22, ICP27 and ICP47 which are essential for the expression of early and late viral gene products. Notably, transcriptional expression of genes regulating HSV replication such as US5, US9, US29, UL30, UL42 and UL52 were also significantly reduced in the presence of MD. We also found MD had no influence on the NF-kB activity in host cells and ICP0 promoter activity of HSV-1.

Summary/Conclusions: Taken together, our study revealed that MD has potent efficacy against HSV induced toxicity through inhibition of the essential immediate-early gene. Therefore, MD could be used as a candidate in the development of anti-HSV drugs.

P-612 FACILE SYNTHESIS OF SILVER NANOPARTICLES AS ANTI-LEUKEMIA AGENT VIA PRODUCTION OF REACTIVE OXYGEN SPECIES

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Background: Silver nanoparticles have been reported owning anti-cancer effect, mainly through elevating reactive oxygen species (ROS), and these particles could also display a synergistic effect against cancer cells with chemotherapeutic drugs. However, whether and how these particles could inhibit the growth of acute myeloid leukemia (AML) cells is unclear. Moreover although several investigators have reported that silver nanoparticles have potential cyto-toxic effect against leukemic cell lines, however, there has been scarce investigation on the effect of silver
nanoparticles exposure on clinical isolates of cancer or leukemia. Meanwhile the mechanism underlying silver nanoparticles-induced biological effects has not been clearly elucidated.

Aims: To achieve a rapid large scale synthesis of silver nanoparticles by microwave irradiation and investigate whether and how silver nanoparticle could inhibit the growth of AML cells.

Methods: Silver nanoparticles were synthesized via microwave irradiation at 150 °C using soluble starch as capping agent. L-lysine or L-arginine served as reducing agent. A series of characterization of silver nanoparticles including surface charge, UV-vis spectrum and so on were studied. Three leukemic cell lines and the bone marrow aspirations of AML patients had been chosen for research, treated with silver nanoparticles or control. Cell viability was measured using CCK-8 assay. The intracellular generation of reactive oxygen species (ROS) and cell apoptosis were measured by flow cytometry. The mitochondrial membrane potential (MMP) was investigated using the fluorescent lipophilic cationic dye JC-1. DNA damage was assayed by confocal laser scanning microscopy.

Results: Silver nanoparticles were synthesized with uniform size. Viability of normal cell and leukemic cell were studied to analyze the cytotoxic effect of silver nanoparticles. AML cells were collected from AML patients. Apoptosis, losses of mitochondrial membrane potential (MMP), the generation of ROS and DNA damage could be enhanced obviously treated by silver nanoparticles with chemotherapeutic drugs, as well as the results treated with silver ions alone. As a chelator, N-acetyl-L-cysteine (NAC) could bind the silver ions to reverse the production of ROS and DNA damage, which validated the important role of silver nanoparticles served as anti-leukemia agent.

Summary/Conclusions: The cytotoxic effect of silver nanoparticles on AML cells and their underlying mechanism and might have significant impact on AML treatment.

P-614
HUMAN UMBILICAL CORD DERIVED MESENCHYMAL STEM CELLS CO-CULTURE WITH CD4+ T CELLS OF HEALTHY DONORS AND SYSTEMIC LUPUS ERYTHEMATOSUS PROMOTE IL-17 EXPRESSION
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Background: Inflammation initiated by T helper 17 (Th17) cells orchestrate the pathogenesis of autoimmune diseases. As a promising candidate for therapeutic treatment of autoimmune disease, human umbilical cord-derived mesenchymal stem cells (hUC-MSCs) appear to directly suppress T cell activation, but the effect of hUC-MSCs on the differentiation of human CD4+ T cells is not clearly known.

Aims: The purpose of this study is to evaluate the effect of hUC-MSCs on the human CD4+ T cells of healthy donors and systemic lupus erythematosus.

Methods: Cytokine and mRNA levels for retinoic acid receptor-related orphan receptor C (RORC) were quantified by ELISA and RT-PCR respectively, and cell sorting was performed by flow cytometry. Twelve SLE patients (ten females, two males) were recruited at the Beijing Hospital. Diagnosis of SLE was established according to the 1982 revised American Rheumatism Association criteria (ARA).

Results: IL-17 production was increased when non-fractionated human peripheral blood mononuclear cells (hPBMCs) isolated from 10 healthy donors that were activated by PHA and then co-cultured with hUC-MSCs (2.18 ± 0.77 vs 17.47 ± 3.81, hUC-MSCs only: 2.43 ± 0.88 P < 0.05). RORC mRNA levels were increased significantly by the addition of hUC-MSCs at day 5 (17.77 ± 0.79 vs 19.07 ± 1.91, P < 0.01). Flow cytometry measured the percentages of Th17 cells when CD4 + T cells were co-cultured with or without hUC-MSCs (13.68 ± 3.79% vs 5.82 ± 1.53%, P < 0.01). In co-cultures of hUC-MSCs and stimulated CD4+ T cells, PGE2 was increased dramatically, compared with CD4 + T cells cultured alone (P < 0.05). No significant difference (P = 0.05) was found in IL-17 production between activated CD4+ T cells/hUC-MSCs in the presence of IL-23 (1429 ± 1666) or not (1374 ± 2083) in healthy donors and SLE patients. The addition of hUC-MSCs to cultures of CD4+ T cells resulted in decreased IFN-γ (46.63 ± 4.27 vs 9.23 ± 1.70, P < 0.01) and enhanced TGF-β production (333.3 ± 43.72 vs 938.3 ± 187.5, P < 0.05).

Furthermore, we detected the percentages of Th1 and regulatory T cells (Treg) separately using flow cytometry. These data were consistent with the data from ELISA analysis (Th1: 17.40 ± 2.07 vs 5.71 ± 2.92%, P < 0.01; Th2: 11.35 ± 2.05 vs 24.49 ± 4.17%, P < 0.05).

Summary/Conclusions: hUC-MSCs promote the expression of IL-17 but not IL-23 production from hPBMCs/CD4+ T cells of healthy donors, which might decrease the production of Th1 and increase the production of Treg. PGE2 is also critical for IL-17 production by hUC-MSCs. This finding provides some controversial effects of BM-MSCs reported recently, and gives a new insight into the potential immunomodulatory function of MSC-based clinical studies.

References:

P-615
POST-OPERATIVE ATYPICAL HEMOLYTIC UREMIC SYNDROME: A CASE REPORT
A Khetarpal, V Gupta and U Kotwal
Transfusion Medicine, Arterioscler Thromb Vasc Biol 2017

Background: aHUS (atypical Hemolytic Uremic Syndrome) accounts for 5–10% of HUS cases. Many etiologies have been known to trigger the disease but post-operative HUS is a relatively newer and uncommon entity. In the postoperative period, it is crucial to differentiate this entity from other causes of anemia, thrombocytopenia, and renal failure. It carries a poor prognosis, with mortality as high as 23% and progression to end-stage renal disease in about 50% cases. We report a case where post-operative period was complicated by aHUS and emphasize the role of Therapeutic Plasma Exchange (TPE) in improving clinical outcome. To the best of our knowledge only 4 cases have been reported in the literature and we report this as the fifth case.

Aims: To evaluate the role of Therapeutic plasma Exchange in achieving hematological remission in post-operative aHUS.

Methods: Therapeutic Plasma Exchange on Com-Tec (Fresenius) Apheresis System using PL1 kit.

Results: A 39 year old female with previous bad obstetrics history underwent hysterec- tomy for Grade IV Endometriosis. She developed sudden severe hypotension in peri-operative period compounded by renal dysfunction on first post-operative day. This was accompanied by micro-angiopathic hemolytic anemia and thrombocytopenia. DCT and ICT were negative. Coagulation profile was normal. Patient was afebrile, had no neurological abnormality and normal ADAMTS 13 levels precluding the diagnosis of Thrombotic Thrombocytopenic Purpura (TTP). Complement levels were within normal range. We performed 9 (7 consecutive days and 2 alternate day) Therapeutic Plasma Exchange which gradually improved the hematological profile with normalization of Platelet counts (90 on post-operative day (POD) t to 160 x 10^9/L on POD 11) and Serum LDH levels (1103 IU/L on POD 3 to 195 IU/L on POD 17). However despite early intervention with hemodialysis patient did not recover from the renal insult and has persistently raised serum creatinine levels requiring maintaine- ment hemodialysis.

Summary/Conclusions: Post-operative aHUS is an uncommon disorder with only 4 cases reported in literature. High clinical suspicion is pivotal in early recognition to prevent significant mortality associated with this condition. Prompt medical inter- vention with Therapeutic Plasma Exchange (TPE) is life saving in these patients.

P-616
THE POTENTIAL OF HYPOXIA PRECONDITIONING ON THE NEURAL GENES EXPRESSION PROFILING IN HUMAN UMBILICAL CORD BLOOD MESENCHYMAL STEM CELLS
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Background: In recent years, human umbilical cord blood-derived mesenchymal stem cell (hUC-MSCs) has been regarded as an alternative source for stem cell therapy.

Aims: In this study, we evaluated the effect of hypoxia preconditioning (HPC) on the expression of Nt-3, GAFAP, Nestin, Oct-4 and Nanog genes and proliferative capacity of hUC-MSCs in comparison with normoxic conditions.

Methods: HPC + Hypoxia protocol includes cultured hub-MSCs for 15 min at 2.5% O2 and 97.5% N2 for 1 hour. After that reoxygenation for 30 min at 21% O2 (HPC), and then hypoxia preconditioned hUC-MSCs subjected to 2.5% O2 for 72 hr (Hypoxia).

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Results: Conclusively, the results showed that hypoxic pre-conditioning is an effective strategy for enhancing proliferation capacity of hH-MSCs; and also can trigger expression of some of the neural genes.

Summary/Conclusions: In addition, the concept of involvement of oxygen tension in the expression of some of the neural genes of hH-MSCs would be a good sign of enhanced neural differentiation potential in vitro.

P-616
ENHANCED ANTITUMOR ACTIVITY OF RGD-MODIFIED ADENOVIRUS MEDIATED LIF AND IL-24 CO-EXPRESSION IN HUMAN MYELOID LEUKEMIA CELLS

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Background: Myeloid leukemia is a common type of leukemia in adults, which is associated with a high relapse rate and poor prognosis. Molecular mechanisms for cancer development and progression are due to multiple defects in a cell that include gene alterations, gene silencing, and alterations in the cell signaling pathways. Gene therapy represents a promising therapeutic modality for cancers. Multi-gene-based combination therapy represents a valid and innovative approach especially for hematological malignancies treatment. Interleukin-24 (IL-24), a member of the IL-10 cytokine gene family, causes growth suppression and apoptosis in various tumor cells. Leukemia inhibitory factor (LIF) is a multifunctional cytokine, it has been shown to have growth inhibition effect on some kinds of leukemia cells. Based on the antitumor features of LIF and IL-24, we developed a LIF-IL-24 bicistronic recombinant adenovirus Ad.RGD-LIF-IL-24 and assessed its effect on myeloid leukemia cells.

Aims: To construct a RGD-modified recombinant adenoviral vector co-expressing LIF and IL-24 and explore its enhanced antitumor effect on human leukemia cells and its mechanism.

Methods: The RGD-modified adenovirus Ad.RGD-LIF, Ad.RGD-IL-24 and Ad.RGD-LIF-IL-24 were constructed by using the method of homologous recombination. LIF or IL-24 gene was transduced into human myeloid leukemia cells via recombinant adenoviral vector. The effect of ectopic expression of IL-24 or LIF on the growth of the myeloid leukemia cells was determined by CCK-8 assay. Cell-cycle distribution and apoptosis of the leukemia cells were determined by FCM. Quantitative Real-Time PCR analysis was used to detect the expression levels of p21 and E2F1 gene. Western blot method was used to detect the expression of p53, Bax, Caspase-3 and Bcl-2 gene expression after adenovirus infection.

Results: The RGD-modified adenovirus Ad.RGD-LIF, Ad.RGD-IL-24 and Ad.RGD-LIF-IL-24 were constructed successfully. They mediate gene transfer into MEG01 and K562 leukemia cells with high efficiency. Treatment with recombinant adenovirus could potentially induce leukemia cells cell-cycle arrest. LIF and IL-24 gene expression could inhibit the growth of MEG01 cells and induce cell apoptosis through the regulation of Bax, Bcl-2, p53, E2F1 and caspase-3 gene expression. Besides, the double gene expression has a synergistic effect.

Summary/Conclusions: RGD-modified recombinant adenovirus could mediate gene transfer into myeloid leukemia cells with high efficiency. Ad.RGD-LIF-IL-24 had growth inhibition and cell cycle arrest effects on myelogenous leukemia cells. LIF and IL-24 gene co-expression had significant synergistic effect on apoptosis induction of the leukemia cells. Furthermore, they showed enhanced effect on up-regulating the expression of Bax, caspase-3 and p53, down-regulating the expression of Bcl-2 and E2F1, which may be responsible for its synergistic antitumor effect on myeloid leukemia cells.

Aims: The aim is to explore the effect of MDSCs on number and function of CD8+ T-cells, tumor growth in vivo and survival in Lewis lung cancer mouse model.

Methods: LLC tumor cells were inoculated into the flank of C57 mice. MDSC were depleted by intravenous administration of Gr-1 blocking antibody. Tail blood was collected on specific time and then CD8+T-cells and MDSCs percentages were detected by flow cytometry. Tumor growth and survival of tumor baring mice were also recorded.

Results: On day 7 after tumor inoculation, the percentages of MDSCs from tumor baring mice were significantly higher than control mice (21.87 ± 1.39%) VS 7.600 ± 0.677%, P < 0.001) and CD8+T-cells were declined than control mice (<7.21)% vs (16.31±0.413%), P < 0.001). Gr-1 blocking antibody was administrated to deplete MDSCs. On day 3 after administration, the percentages of MDSCs were rapidly decreased (1.578 ± 0.299% VS 7.384 ± 5.214%, P < 0.001) and CD8+T-cells were significantly higher than control mice (9.464 ± 0.820 VS 4.024 ± 0.488, P < 0.001). On day 10 after administration, MDSCs percentages were higher than previous, but lower than control mice (11.98 ± 5.95%) VS 63.66 ± 5.763%, P = 0.0016) and CD8+T-cells were deceased than previous but higher than control mice (7.806 ± 0.55%) VS 2.894 ± 0.330%, P = 0.0019). Tumor growth in mice with MSDCs depletion was markedly inhibited compared with control group (P < 0.05). The survival of mice with MDSCs depletion was notably longer than control mice (P = 0.036, median survival 46 days VS 63 days).

Summary/Conclusions: MDSCs depletion in LLC tumor baring mice eliminated the inhibiting of CD8+T-cells by MDSCs. Tumor growth was delayed and survival was prolonged than control mice.

P-618
THE EFFECTS OF TH9, TH17, CD4 + CD25 + FOXP3 + REGULATORY T CELLS IN PERIPHERAL BLOOD OF PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

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Background: Chronic lymphocytic leukemia (CLL) is the most common form of leukemia, which is characterized by clonal expansion of CD5+ B cells in periphery and lymphoid tissues. CLL progression is mainly affected by the immune status of the CLL patients. Several immune cells and mediators contribute to immunopathogenesis of CLL, such as Th1 and Th2 cells increased absolute number of total T lymphocytes has been shown in CLL patients which was associated with expansion of CD8+ T cells. In some autoimmune diseases, CD4+CD25+FoxP3+ regulatory T (Treg) cells maintain self-tolerance and inhibit anti-tumor responses, T helper (Th9), (Th)17 cells may enhance inflammatory and antitumor responses.

Aims: The present study aims to investigate the presence and significance of Th9, Th17, Treg cells and the related cytokines (IL-9, IL-17, TGFB) in peripheral blood of patients with adult Chronic Lymphocytic Leukemia.

Methods: Peripheral blood samples were obtained from 48 CLL patients from the Second Hospital of Dalian Medical University (Dalian, China), including 14 females, 34 males; mean age, 66 ± 12 years, excluding those with a current infection. Control samples were collected from 40 healthy volunteers (13 females, 27 males; mean age, 61 ± 7 years), none of which suffered from any immune diseases.

Results: Compared with healthy subjects, the percentages of patients with CLL; the percentages of Th9, Th17 and Treg cells in peripheral blood were detected with Flow cytometry. The serum levels of IL-9, IL-17 and TGFB were examined by ELISA. Data analysis was carried out using SPSS 18.0 statistical software. Descriptive data was summarized and analyzed.

Results: Compared with healthy subjects, the percentages of Th9, Th17 and concentrations of IL-9, IL-17 were all significantly increased in patients with CLL ([IL-9: 0.330% VS 0.270%; P < 0.05; (2.05 ± 0.419) VS [0.99 ± 0.34%], P < 0.05] ; [IL-17: 7.852% VS 7.214%], P < 0.05; [10.64 ± 1.89%] VS [7.19 ± 2.66%], P < 0.05])the percentages of CD4+CD25+FoxP3+ cells and concentrations of TGFB were lower in patients ([IL-9 ± 0.330% VS 0.270%; P < 0.05; (2.05 ± 0.419) VS [0.99 ± 0.34%], P < 0.05]); ([IL-17: 7.852% VS 7.214%], P < 0.05; [10.64 ± 1.89%] VS [7.19 ± 2.66%], P < 0.05)there were nearly no difference in terms of Th9, Th17 and concentrations of IL-9, IL-17 were all negatively correlated lymphocytic accounts [γs = -0.352, P = 0.041; γs = -0.388, P = 0.029; γs = -0.439, P = 0.013; γs = -0.404, P = 0.026] of patients with CLL; the percentages of CD4+CD25+FoxP3+ cells and concentrations of TGFB were positively correlated with lymphocytic accounts [γs = 0.413, P = 0.023; γs = 0.408, P = 0.027] of patients with CLL.

Summary/Conclusions: The abnormality Th9, Th17 and Treg cells and their related cytokines (IL-9, IL-17 and TGFB) changes in patients with CLL, which may be involved in immunological pathogenesis of CLL.

P-617
THE INFLUENCE OF MDSCS DEPLETION ON CD8+ T-CELLS IN LUNG CARCINOMA MOUSE MODEL

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Background: Recently, there has been a growing concern about home marrow suppression induced by tumor initiation and growth. Myeloid-derived suppressor cells (MDSCs), as a significant element in marrow suppression, are precursor of dendritic cells, macrophages and granulocytes. MDSCs facilitate tumor development and tumor immune escape by inhibiting cellular immune response, especially depress number and function of CD8+T-cells.

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P-619
THE SEROLOGICAL CHARACTERISTICS AND FAMILY GENETICS OF A NOVEL HLA ALLELE, HLA-A*26:82
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Background: To date, there are 16,429 HLA alleles documented according to the IMGT / HLA Sequence Database in January 2017, and more than 80% of them were submitted in the last 10 years. Besides identification of new sequences, many of the novel HLA alleles’ profiles have not included their serological reactivities. HLA-A*26:82 was first detected in our laboratory during our HLA typing for a potential donor from China Bone Marrow Donor Program (CMDP). For further study, the serological characteristics and inheritance investigation were performed.

Aims: To investigate the sequence, family genetics and the antigen serological characteristics of a novel HLA allele, A*26:82.

Methods: The routine HLA typing for the potential donors from CMDP were performed by hi-alliec Sequence-Based Typing method, using a commercial kit (ROSE Europe GmbH, Frankfurt, Germany). In the cases, there was no fully matched HLA typing result obtained, allele group specific HLAssure SE SBT Typing Kit (Texas Bio-gen Inc., Taipei, Taiwan) was employed to identify the nucleotide sequences of the novel allele. Fresh blood samples were collected of the proband and his family members with their consent, in order to analyze the serological reactivities and the possible haplotype associations bearing the novel allele. The HLA serological specificity was indicated by One Lambda (JANUS2D) HLA kit.

Results: No fully matched result was obtained at HLA-A locus in HLA typing for a donor, which suggested the possible existence of a novel allele. The latter analysis indicated that the proband have a novel nucleotide sequence at HLA-A locus, the new sequence was mostly close to those of HLA-A*26:01:01:01, but 1 nucleotide substitution in exon 4, by nt 746 C-A (codon252 ACC-AAC), that resulted in one amino acid substitution, Thr-Asn. The novel HLA-A allele was officially named as HLA-A*26:82 by the WHO Nomenclature Committee for Factors of the HLA system. The HLA typing results of the proband and his daughter were assigned as HLA-A*26:82, 23:02; B*48:01, 15:01; DRB1*11:01, 12:02 and A*26:82, 23:01; B*48:01, 50:01; DRB1*11:01, 13:02, respectively. The haplotype associations to A*26:82 could be A*26:02, B*48:01-DRB1*11:01. According to the serological reactivity patterns, the antigen encoded by the novel HLA-A allele showed the characteristics of A26.

Summary/Conclusions: A novel HLA-A allele, HLA-A*26:82, was identified and associated to the haplotype, A*26:82-B*48:01-DRB1*11:01, and the encoded antigen showed the serological specificity of A26.

P-620
IDENTIFICATION OF A NOVEL HLA ALLELE, HLA-A*24:198 BY SEQUENCE-BASED TYPING IN A CHINESE HEMATOPOIETIC STEM CELL DONOR
X Li and J Ji
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Background: HLA, as a consequence of human evolutionary mechanisms that diversify the peptide-presenting function of the major histocompatibility complex, is the most polymorphic in the genome. To date, more than 3900 HLA alleles have been identified according to IPD-IMGT/HLA Database. Aims: To identify and confirm a novel HLA allele in a hematopoietic stem cell donor of Liaoning, China.

Methods: The routine HLA genotyping was performed by sequence-based typing SBTexcellerator®, Genome Diagnostics B.V., Arnhem, Holland. HLA-A locus specific amplification was performed from exon 1 through exon 8 by thermal cycling the amplification primer mix and template DNA using the Long Rang PCR kit (Qiagen, Hilden, Germany). The exons 2, 3, and 4 were sequenced in both directions using SBTexcellerator® sequence primer, and Big Dye® Terminator v3.1 Reaction Kit (Applied Biosystems, Torrance, CA). The final reactions were purified using Ethanol/EDTA precipitation to remove unincorporated sequence primers and residual nucleotides and run on ABI PRISM® 3730xl Genetic Analyzer (Applied Biosystems, Foster City, CA). Sequencing data was analyzed using SBTengine® software.

Results: The obtained heterozygous sequence showed the presence of a novel allele, as the nucleotide sequence did not match with any known allelic combination. And only one nucleotide was heterozygous in the homozygote, so we deduced that one of two homozygous alleles was a novel allele. The result was that one allele was HLA-A*24:02:01, and the other one was a new HLA-A*24 allele.

Summary/Conclusions: The new sequence differs from HLA-A*24:02:01 by a single nucleotide substitution in exon 2 at position 157 (D=A); This mutation results in one codon change: at codon 29(GAC→ACC) where an Aspartic Acid (D) is substituted by an Asparagine (N). The nucleotide sequence was submitted to GenBank and given the accession number JQ392563. The name A*24:198 has been officially assigned by the WHO Nomenclature Committee for Factors of the HLA system.

P-621
SEQUENCE ANALYSIS OF A NOVEL HLA ALLELE HLA-DRB1*13:161
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Background: With the rapid development of genetic immunology and molecular biology, the understanding and elucidation of the structure and function of HLA system has been gradually improved. At the same time, new alleles are constantly being discovered. These new findings not only rich HLA family, but also find a breakthrough point for the study of genetic superiority or disappearance of national gene.

Aims: To identify the novel HLA allele HLA-DRB1*13:161 and to analysis the nucleotide sequence of the abnormal reaction pattern.

Methods: The sample from volunteer of Chinese Marrow Donor Program were detected using PCR-SBT method. The ambiguous novel HLA allele was confirmed with single stranded SBT method, then DNA sequencing was performed to identify the difference between the novel allele and HLA-DRB1*13:12:01 allele. size: 12:96; line-height: 150%; break-through point for the study of genetic superiority or disappearance of national gene.

Results: The sequence of the novel allele was different from all alleles in the HLA databases. After analysis, the novel allele has 1 nucleotide change from the DRB1*13:12:01 at nucleotide 230 where G→T (codon 53 CGG→CTG) resulting in a coding change, 53 Arg is changed to Leu.

Summary/Conclusions: The result suggested that the allele was a novel allele and it has been officially named HLA-DRB1*13:161 by the World Health Organization (WHO) HLA Nomenclature Committee.

P-622
Abstract has been withdrawn

P-623
ASSOCIATION STUDY OF HLA ALLELES (A, B, DRB1) AND HIV-1 INFECTION PROGRESSION IN THE HAN POPULATION OF HUBEI PROVINCE, CHINA
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Background: HIV-1 infected individuals show different disease process. As many as 95% of HIV-1 infected people progressed to representative patients 2 to 10 years later, the natural disease course of other 5% percentage tends to over 10 years, these infected persons show no characteristic symptom of AIDS, maintain the amount of CD4+ T cells in normal without antiviral treatment[1]. The influencing factors of HIV-1/AIDS disease progression mainly have hereditary factors including HLA specificity, auxiliary receptor polymorphism of HIV-1 and viral factors. Recently research abroad has been demonstrated that multiple HLA genotype have associations with AIDS disease progression[13-15], while domestic research differ sharply, this is mainly due to regional and ethnic differences in the distribution of HLA alleles[16-17]. The correlation of HLA alleles polymorphism analysis and AIDS disease progression remains elusive in Han nationality from Hubei province of China gives

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a hand for the research of HIV-1 infected people who didn’t progressed for a long time.
Aims: Firstly, we obtained gene frequencies of HLA alleles (A, B, DRB1) of HIV-1 infected group and AIDS patients group in Hubei province, China, then, comparing this two groups to see if there are any differences, at last, we made a preliminary research of association of HLA Alleles (A, B, DRB1) and HIV-1 infection progression in HIV-1 infected group.
Methods: An amount of 424 HIV-1 seropositive individuals were chosen as study subjects. We divided this individuals into two groups – HIV-1 infected or AIDS patients according to clinical diagnosis standard. HLA-A, B, and DRB1 allele typing was performed using polymerase chain reaction-sequence-specific oligonucleotide (PCR-SSOP) and polymerase chain reaction-sequence based typing (PCR-SBT) techniques. Arlequin ver3.0 was used to acquire the allele and haplotype frequencies of HLA-A, B, and DRB1, whereas Epi Info 7 and SPSS18.0 was used to analyze the differences of HLA alleles between HIV-1 infected and AIDS patients.
Results: Logistic regression analysis revealed that B*57:01 maybe show a protective effect on HIV-1 infection, whereas DRB1*04:05 maybe show a positive effect on HIV-1 infection. All of these effects were independent of age, gender, and infection way of the host. Furthermore, Some of the common HLA haploid individual may have impact on HIV-1 infection. Homozygous HLA Alleles (A, B, DRB1) as well as HLA-Bw4-Bw6 showed un conspicuous effect on HIV-1 infection.
Summary/Conclusions: These results confirmed that HLA gene polymorphism influence AIDS disease progression. The correlation study of HLA alleles polymorphism analysis and AIDS disease progression gives a hand for the research of HIV-1 infected people who didn’t progressed for a long time. Furthermore, this study will open up avenues for AIDS prevention and precise care.

P-624
THREE HLA NOVEL ALLELES WERE IDENTIFIED BY SEQUENCE-BASED TYPING IN CHINESE INDIVIDUALS
W Qiang
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Background: More and more novel alleles have been confirmed with the development of HLA gene typing and the increasing capacity of the China bone marrow bank. Up to January 20, 2017, 1800HLA-A alleles and 4647 B alleles have been reported in the HLA gene database EBI (http://www.ebi.ac.uk/imgt/hla/). Aims: To identify three novel alleles of HLA by using group specific primer sequencing (GSSP).
Methods: Using the method of group specific primer sequencing to confirm the suspicious samples which performed by PCR-SBT sequencing but no exact result. The measured sequences were submitted to gene library of Genbank (www.ncbi.nlm.nih.gov/GenBank) and compared to the known allele sequences in the highest homology, then submitted the sequences to EBI (http://www.ebi.ac.uk/imgt/hla/) to obtain submission numbers and official gene nomenclature.
Results: 3 new alleles were different from all known HLA alleles, of which two were the base mutation at 266 and 164 of exom2, which resulted in the change of amino acids. The third novel allele is caused by the base deletion at 287 in exon 2, resulting in the change of the reading frame of the gene and the change of amino acid and the termination of the translation in advance.
Summary/Conclusions: 3 cases of suspected new alleles were identified, and were assigned officially by the HLA Nomenclature Committee, assigned A*11:152, B*55:37 and B*44:237N.

P-625
STUDY ON THE ANALYSIS OF HIGH-RESOLUTION HLA-B ALLELES FROM 4253 HEMATOPOIETIC STEM CELL DONORS OF HAN NATIONALITY FROM HUBEI POPULATION
W Qiang
Wuhan Blood Center, Wuhan, China
Background: HLA is a group of closely linked, dominant genetic systems that have been found in the human genome to date. HLA is an important immune recognition and response system. It is of great significance in transplantation immunity, tumor immunity, infection immunity and so on.
Aims: analyze the genetic polymorphism, common and Well-documented (CWD) and rare alleles of high-resolution HLA-B alleles by analysis from hematopoietic stem cell (HSC)donors in Chinese.
Methods: PCR-sequence-based typing method was applied for HLA-B high-resolution genotyping of 4253 unrelated Han nationality from Hubei healthy donors of hematopoietic stem cells in Hubei branch of Chinese National Marrow Donor Program registry.
Results: 90 alleles of HLA-B locus were found. The frequencies of the most common alleles were B46:01(0.1526), B48:01(0.0824), B40:01(0.0756), B51:01 (0.0656), 82 alleles of HLA-B were CWD, which account for 99.8% of total number of samples. And a few rare alleles not reported in Chinese population were found.
Summary/Conclusions: The results of high-resolution, CWD and rare alleles reflect the HLA distribution in Han nationality from Hubei population, and provide reference data for the study on population genetics of populations in China.

P-626
DETECTION OF FALSE POSITIVE OF HPA GENOTYPE BY PCR-SSP METHOD
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Background: PCR-SSP is one of the most common technologies for HPA genotyping. However, nonspecific amplification often appeared for this method due to the complex primer design and competition between amplified templates. This amplification led to false positive, resulting in error genotyping.
Aims: By analyzing the difference between specific amplified bands and nonspecific amplified bands, the false positive recognition capability was improved to ensure the correct genotype result.
Methods: PCR-SBT was used to confirm whether the PCR-SSP result was true positive, and the internal reference band was regarded as true positive band. Genetool software was used to analyze the difference between specific amplified bands and nonspecific amplified bands in the picture, and transformed the image data to the digital data. SPSS18.0 software was used to analyze the digital data.
Results: Consistency of specific amplification was better and the bands were clear. DNA length obtained by Genetool software was consistent with the reagent specification (P > 0.5), and the intensity was stronger than that of the nonspecific amplification (P < 0.01). Nonspecific amplification was blurred, smeared, multiple strip coexistence and DNA length was not consistent with reagent specification.C
Summary/Conclusions: The above method can effectively distinguish the specific and nonspecific amplification, reduce the typing error and get the correct classification results.

P-627
IDENTIFICATION OF TWO NOVEL GENOMIC FULL-LENGTH SEQUENCES OF HLA-E IN CHINESE INDIVIDUALS
Y Xu, S Wang and W Hong
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Background: HLA-E is one of the non-classical HLA class I genes. The whole gene of HLA-E include 8 exons, 7 introns and 5′promoter and 3′UTR. At present, the study of polymorphism analysis mainly aims at the variation in exon 3 of HLA-E, which determines HLA-E*0101 or HLA-E*0103. However, studies about identification of the polymorphisms on genomic full-length HLA-E and its novel alleles are rarely reported.
Aims: To establish a method for identifying HLA-E genomic full-length sequence, and detect novel full-length alleles in healthy blood donors in Shenzhen, China.
Methods: Peripheral blood DNA were extracted from the whole blood of all research subjects. The amplification primers (EU5′-GCCGAGCCAGGACTAATTTCT-3′;EU3′-CAGGGGAAGGGACACAGGTTCAC-3′) and walking sequencing primers were designed in conserved regions according to the sequences of HLA-E released on the IMGT/HLA database. We use a high-fidelity and long fragment PCR reaction system to amplify a 1.6 kb fragment covering the whole gene of HLA-E, and PCR product were sequenced by walking sequencing primers on Sanger sequencer ABI3730. Sequencing fragments were assembled and checked by Seqman Software, and the typing results were obtained by comparing the sequences with known allele sequences released on the IMGT/HLA database.
Results: During this research, we successfully established the method for amplifying genomic full-length sequence of HLA-E and sequence-based typing assay. Two novel HLA-E alleles with the length 3.6 kb had been nominated by WHO HLA Nomenclature committee as HLA-E*01:01:01:06 and HLA-E*01:01:01:07. Compared with the most related allele HLA-E*01:01:01:01, HLA-E*01:01:01:06 has one nucleotide change at nt-26 (G→T) in 5′-promoter, and HLA-E*01:01:01:07 has one nucleotide change at nt3345 (T→C) in 3′-UTR.

Summary/Conclusions: The polymorphism data of genomic full-length HLA – E in Chinese individuals needs to be explored and extended, and the method we developed here supply the key technique for population genetics studies of HLA-E.

P-632

DISTRIBUTION OF HLA ANTIGEN IN PLATELET DONORS IN CHANGZHOU AREA
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Background: With the increasing use of platelets in the clinical, the infusion problems been more and more attention, but the platelet transfusion refractor (PTR) phenomenon is more and more common, severe input of alloreactive platelets in the body was Rapid damage or even endanger the lives of patients, so the study and solve the problem of PTR has become an important issue of clinical blood transfusion. HLA antibodies are the most common immune factors that cause PTR, accounting for 80% of all immune factors and 11.7% of all etiologies. There are HLA-A and B antigens on platelet membrane. HLA antigen can be produced by repeated transfusion due to strong antigenicity. According to statistics, more than 10 times the blood transfusion, antibody positive rate of 30%~80%. If patients with HLA antibody induction of random platelets, the antibody can react with the input platelet, resulting in thrombocytopenia, resulting in transfusion of platelets ineffective, and produce adverse blood transfusion reactions. At present, the effective solution is to select HLA-compatible or compatible platelets. Therefore, you can choose with the patient ABO, Rh blood type isotype, and HLA antigen matched platelet donors, infusion of white light irradiation alone can achieve good results.

Aims: HLA antibody detection was performed on fixed-platelet donors and HLA antibody detection was available for patients with platelet transfusion. A single platelet was collected from a donor using HLA-free antigen for HLA antibody to achieve better efficacy.

Methods: 125 cases of platelets were collected and HLA genotype was detected by PCR-SSP. The positive cases were analyzed statistically.

Results: HLA-B locus was found in 11 sites, mainly A02, A11, A24-based; HLA-B site detected 23 sites, mainly B46, B15, B46, B13-based; HLA-DRB1 Haplotype 13 sites, mainly DRB1 09, DRB1 12, DRB1 15-based. The HLA-A, B, DRBI loci have polymorphism in the existing database of free-platelet donors in Changzhou.

Summary/Conclusions: Due to the high genetic polymorphism of HLA, it is very difficult to find a perfectly matched donor. We can provide a number of non-HLA-specific antigen-free single platelets for patients who produce HLA antibodies with multiple platelets in order to achieve a better therapeutic effect. The establishment of a platelet donor HLA library will have far-reaching implications for addressing the problem of platelet ineffective infusion.

P-633

IDENTIFICATION A NOVEL HLA ALLELE HLA-B*15:275
J Ding, X Li, D Bi, X Wang, T Yan, Y Liu, L Hou, J Li, F Lu and P Jiang
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Background: HLA (human leukocyte antigen) system is the most abundant genetic system known to humans so far. The HLA system is composed of a series of closely linked loci consisting of highly polymorphic genetic complex. HLA gene is the necessary condition for the immune system to recognize itself and its own and maintain the stability of the environment in vivo. HLA is distinctly racially specific, so the identification of HLA in the region of new alleles can be improved with the opportunity to find donors.

Aims: To confirm the novel allele HLA-B*15:275 and analyzed the nucleotide sequence of the abnormal reaction pattern, tunity to find donors.

Methods: The HLA typing of sample DNA was performed by PCR-SSP. The ambigu-ous novel HLA allele was confirmed with single stranded SBT method, then DNA sequencing was performed to identify the difference between the novel allele and HLA-B*15:275 allele. Finally, it was modeled by Swiss-Model to three-dimensional structure of HLA Molecule.

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Results: The novel allele is not the same with all known HLA-B allele sequence. After analysis, there were two nucleotides differed from the HLA-B*15:18:01. One is at position 486 where G→C (codon 138 ACG→ACC) resulting in a coding change. The other is at position 527 where A→T (codon 152 GAG→ GTG) resulting in a coding change, 152Glu is changed to Val.

Summary/Conclusions: The result suggested that the allele is a novel allele that it has now been officially named B*15:23:35.7 by the World Health Organization (WHO) HLA Nomenclature Committee.

Methods: A total of 85 confirmed SFTS patients and 286 unrelated healthy individuals from Shandong province were genotyped by PCR-sequence specific primer (PCR-SSP) for KIR. Allelic frequency were estimated by direct counting and compared using χ² test. Results: The frequency of KIR2DL2 and KIR2DS2 in SFTS patients are significantly lower than that in control group (P < 0.05). And the odds ratio of KIR2DL2 and KIR2DS2 were 0.1215 and 0.3181 respectively.

Summary/Conclusions: KIR2DL2 and KIR2DS2 might have correlated with the occurrence of SFTS.

Histocompatibility in Stem Cell Transplantation

P-634 NUCLEOTIDE SEQUENCE ANALYSIS OF A NOVEL HLA-A*35:230 ALLELE
D Bi, X Li, Y Liu, J Ding, P Jiang and F Lu
Institute of Transfusion, Blood Center of Heilongjiang Province, Harbin, China

Background: HLA is the most complex human genetic polymorphism system, it is a series of closely linked genes composed of highly polymorphic complex. The earliest research on HLA typing was based on serology and cytology, the most accurate is also the most thorough PCR-SBT technology as the gold standard for genotyping currently.

Aims: To confirm the novel allele HLA-A*35:230 and analyzed the nucleotide sequence of the abnormal reaction pattern.

Methods: The HLA typing of sample DNA was performed by PCR-SBT. The ambiguous novel HLA allele was confirmed with single stranded SBT method, then DNA sequencing was performed to identify the difference between the novel allele and HLA allele.

Results: The novel allele is not the same with all known HLA-B allele sequence. After analysis, there were 3 nucleotides differed from the HLA-B*35:88 gene sequence occurred in the third exon, at position 379 where C→G resulting in a coding change, 103 Leu is changed to Val; at position 499 where A→T resulting in a coding change, 143 Thr is changed to Ser; at position 512 where G→T resulting in a coding change, 147 Thr is changed to Leu.

Summary/Conclusions: The result suggested that the allele is a novel allele that it has now been officially named HLA-A*35:230 by the World Health Organization (WHO) HLA Nomenclature Committee.

P-635 CORRELATION BETWEEN KILLER CELL IMMUNOGLOBULIN-LIKE RECEPTOR AND SEVERE FEVER WITH THROMBOCYTOPENIA SYNDROME
Y Zhang, X Nie, Y Song and C Zhu
HLA Lab, Blood Center of Shandong Province, Jinan, China

Background: Sever fever with thrombocytopenia syndrome (SFTS) is an emerging infectious disease in East Asia. SFTS is caused by a novel bunyavirus, SFTS virus (SFTSV), which could be transmitted through tick bite. Shandong Province is the second highest incidence area of SFTS in China. There were 761 SFTS cases reported in Shandong Province from 2011 to 2014 with an overall mortality rate of 12%. SFTS is a hemorrhagic fever disease with fever and thrombocytopenia as the main clinical manifestations. The body temperature of most SFTS cases usually exceeds 38°C. Over 70% of the patients have fever over 39°C. Patients often had headaches, muscle aches, gastrointestinal symptoms such as loss of appetite, nausea, vomiting, abdominal pain, diarrhea and hematochezia, leukopenia, fever and kidney dysfunction. The majority of patients has a good prognosis and recovered. On the contrary, some patients have a poor prognosis because of basic diseases, older ages, neuropsychiatric symptoms, bleeding tendency and hyponatremia. Those patients who had severe bleeding tendency and in critical condition might die of multiple organ failure. In multivariate analysis, the odds for SFTS were 2.4-4.5fold higher in patients who reported tick bites or presence of tick in the living area. The killer cell immunoglobulin-like receptors (KIR) are interacting with human leukocyte antigens (HLA), regulating the activations of natural killer (NK) cells and certain T-cell subsets in response to microbe infection. There are accumulated literatures reporting on the association of KIR with different infectious diseases. but the correlation between KIR and SFTS had not yet been investigated.

Aims: To investigate killer cell immunoglobulin-like receptor (KIR) for a correlation with Severe Fever with Thrombocytopenia Syndrome (SFTS).

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The result of cluster analysis is similar to the anthropological and historic study of

Summary/Conclusions:
The polymorphism of HLA-A, B, DRB1 are very multiplicity.

Results:

Methods: The HLA-A, B, DRB1 low genotyping (n = 12995) was done by the poly-
merase chain reaction with sequence specific primer and sequence specific oligonu-
kleotide probes technique. The genetic distance between among the 14 populations were

Background: The Human Leukocyte Antigen (HLA) is the most polymorphic region of the human genome. Compared with Sanger-sequencing Based Typing (SBT) meth-
ods, Next Generation Sequencing (NGS) has significant higher throughput and depth
sequencing characteristics, becoming increasingly attractive for HLA typing.

Aims: The aim of this study was to evaluate the presence of rare HLA alleles detected by SBT in Shaanxi region using NGS platform, and estimate haplotype pairs containing the rare alleles using their phenotypes and reference database.

Methods: 1040 healthy potential stem cell donors from Chinese Marrow Donor Pro-
cord (CMDP, Shaanxi Province) in 2016 were typed at high resolution using SeCore
SBT kits (ThermoFisher Life Technologies); Exon 2-4 (HLA-A, B, C, 2 and 3 (DQB1)
and 2 (DRB1) were sequenced, and data were analyzed by uTYPE 7.2. Four DNA
specimens from peripheral blood carrying rare alleles were performed and identified by the NXTyper's workflow (One Lameda, Inc.) and the accompanying TypeStream
software V1.1 on the Ion Torrent NGS platform. The amplification of 5'UTR full length of HLA-A, B, C loci and partial length of HLA-DRB1, DQB1 loci were sequenced using Ion Torrent S5 S30 chip. We used the phenotype and "Be The Mannal Registry Haplo frequency, a human MHC database (http://mhc-world.org) as the reference
database to predict haplotype pair containing the rare allele.

Results: According to IMGT/HLA Database 3.26, the complete matched SBT pattern of the four cases was B*40:113-C*48:01 (case 1), B*40:01/C*58:19 (case 2),

Background: The Human Leukocyte Antigen (HLA) is the most polymorphic region
development of novel HLA haplo-

disease.

Aims: To analyze the human leukocyte antigen complex class I (A-, C-, and B) and class II (DRB1) and -DQB1 linked haplotypes of Chinese Han population, and to study the recombination events of the five classical loci in the inheritance of HLA haplotypes.

Methods: A total of 1409 peripheral blood samples were collected from 297 families in Chinese Han population who came to Shenzhen Blood Center for HLA typing. HLA-A/B/C/DRB1/ DQB1 alleles were typed with microarrays SSO assay based on Lucena's platform using a commercially available LABType® SSO HLA Typing Kits

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Background: The human leukocyte antigen (HLA) genes are the most polymorphic in the human genome. As of April 2016 a total of 10730 HLA classIalleles and 3743 HLA classIIalleles have been assigned. There are more than 4200 alleles HLA-B alleles assigned. There have been 4,828 HLA-B alleles documented according to the IMGT/HLA Database, and most of them were submitted in the recent decades. Besides the identifications of new alleles have been assigned. There are more than 4200 alleles HLA-B alleles assigned. Among 815 offspring individuals of 297 families in Chinese Han population, 14 individuals with HLA-A-C-DRB1-DBQ1 linked haplotypes had a recombination rate of 1.718%. Among 14 HLA haplotypes recombined family, 5 of them are found to have a crossover between HLA- A and -C loci and 9 of them have a crossover between HLA- B and -DRB1 loci. 6 of these recombination events occurred in the most common haplotypes A*0201,C*0302,B*0801,DRB1*0101,DRB1*0301 of Chinese Han population. Among 14 cases of recombination, 8 of them were formed by a crossover between maternal chromosomes, 6 cases a crossover between paternal chromosomes. Individuals with an exchange between A/C loci are all females. Among 9 cases with an exchange between B/DRB1 loci, 8 of them were males and 1 case was female.

Summary/Conclusions: This research enlarged the HLA haplotypes genetic map of Chinese Han population. It preliminarily locates the position and discipline of the occurrences of recombination, proving the valuable genetics data to the further research of the mechanism of HLA recombination. Meanwhile, NGS presents a significant technical advantage for accurate high-resolution HLA typing, and it is useful for resolving common ambiguities observed using current SBT method.

Methods: The donor of China Marrow Donor Program (CMDP) was originally typed for the HLA-A, B and DRB1 loci at high resolution level using commercial polymerase chain reaction sequence-based typing (PCR-SBT) kits according to the manufacturer's instruction. Results: The HLA-B*27:013 has one nucleotide change from B*27:04:05 at position 121 (C>T).

Summary/Conclusions: The name B*27:013 has been officially assigned by the WHO Nomenclature Committee in March 2013.

Aims: To resolve the platelet transfusion refractoriness (PTR): Methods: Our lab established a voluntary apheresis platelet donor registry in the Nanning Institute of Transfusion Medicine, Nanning, China. Results: The P values of the HLA-A and HLA-B loci showed that the HLA allelic frequencies in the Zhuang populations in Guangxi area were deviated from the HWE equilibrium (HWE) test at each locus was performed by Arlequin software package, the P-values are considered significant at the 0.05 level.

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Summary/Conclusions: The name B*27:013 has been officially assigned by the WHO Nomenclature Committee in March 2013.
equilibrium (P > 0.05), a total of 11 HLA-A alleles, 24 HLA-B alleles and 58 A-B haplotypes were identified.

Summary/Conclusions: The Guangxi Zhuang population of platelet donor registry was genetically close to southern Chinese populations, but it still keeps its unique genetic characteristics, which can rapidly find compatible donors for patients with PTR.

**Histocompatibility in Organ Transplantation**

P-646

DETERMINATION OF DONOR–SPECIFIC ANTIBODIES (DSA) STRENGTH TO USE FOR VIRTUAL CROSSMATCH

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Background: Human leukocyte antigen (HLA) antibodies can be the barrier to organ transplantation. Donor-specific antibodies (DSA) can cause antibody-mediated rejection. The strength of DSA correlates with the risk of antibody mediated rejection both pre- and post transplantation. Theoretically, the sample with HLA-DSA as identified by separately HLA class I and II should be positive by other crossmatch techniques. Many centers have attempted to define the strength of DSA as mean fluorescent intensity (MFI) values that can predict crossmatch results. However, the strength of DSA detected was different among laboratories.

Aims: The aim of this study was to determine the strength of HLA-DSA associated with cytotoxicity crossmatch (CDCXM) and flow cytometric crossmatch (FCXM). Then, to define a cutoff value for DSA strength that can predict a positive virtual crossmatch results.

Methods: We retrospectively analyzed the results performed at Histocompatibility and Immunogenetics Laboratory, National Blood Centre Thai Red Cross Society, during 2014 to 2016. Totally 83 samples included 18 samples of APHIA Quality Assurance Program (QAP) and 65 samples of patients received living donor related kidney transplants. All samples had been crossmatched by CDCXM and 19 samples by FCXM. We detected HLA-DSA using Luminex single bead-antigen (Labscreen LABScreen®, Onealmda, Canoga Park, CA) assay. To analyze the strength of HLA-DSA, if the sample contained more than one antibody, the highest MFI value of such sample with positive FCXM will be considered. To determine the cutoff of HLA-DSA, the lowest MFI value detected as positive by FCXM was selected.

Results: A total of 83 samples were composed of 44 samples of absent HLA-DSA and 39 samples of present HLA-DSA. Among those 16 of 39 samples were positive for CDCXM and 19 of 39 samples were positive for FCXM. For a positive CDCXM, the lowest MFI of HLA class I – DSA was 17066 and HLA class II – DSA was 8428. Regarding a positive FCXM, the lowest MFI of HLA class I - DSA was 1056 and HLA class II – DSA was 824. Additionally, the MFI of HLA class I- DSA was 1056 and HLA class II - DSA was 824 that gave 100% consensus with FCXM QAP samples. It was found that 26 samples of tested serum had HLA class I – DSA and 16 samples of HLA class II – DSA, those showed the positive predictive values (PPV) and negative predictive values (NPV) for HLA class I – DSA were 100% and 92%, respectively. Interestingly, the PPV and NPV of HLA class II - DSA was 100% and 100% respectively.

Summary/Conclusions: The minimum MFI value of a positive FCXM tested samples for HLA class I and II were 1056 and 824, respectively and considered as cutoff value for the positive HLA antibodies. The MFI strength of HLA-DSA that gave positive FCXM may be used for virtual crossmatch. However, these strength values may be varied which depend on various factors such as sample size of the study, kit reagents and the methodology.
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