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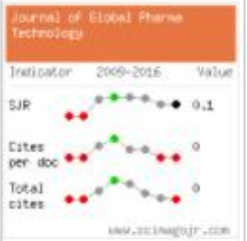

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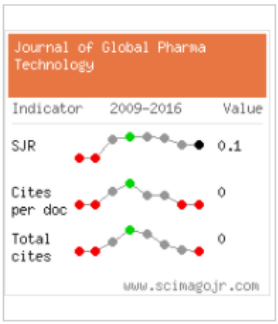

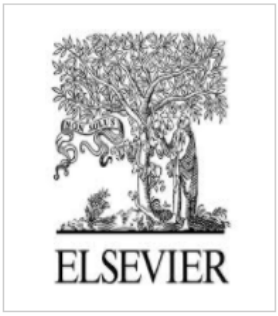

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RESEARCH ARTICLE

Trichomoniasis among Pregnant Women in Denpasar City, Bali, Indonesia

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Abstract: Objective: This study aimed to investigate the incidence of T. vaginalis infection among pregnant women in the city of Denpasar, Bali, Indonesia and the associated factors. Methods: There were 376 pregnant women who participated in this study. Study participants were selected using cluster sampling method. These pregnant women were then interviewed and tested for T. Vaginalis infection (microscopic and culture). Results: Infection of T. vaginalis was found in 7.4% of the pregnant women. The infection is most likely to be found in pregnant women who have a lower education level, middle-class status and a history of STIs. It is also most likely if they never had any vaginal douching before if they have intercourse ≥3 times per week, use sitting toilets and use river water as their main water source. Type of toilet used, the practice of vaginal douching, and condom usage show a significant association with trichomoniasis among pregnant women (p values were 0.001, 0.002 and 0.000 respectively). Conclusion: Early detection of sexually transmitted infections (STIs), especially T. vaginalis infection, should be performed during prenatal care to avoid the negative effects on pregnancy.

Keywords : Pregnancy, STI, Vaginal trichomoniasis

Introduction

Trichomoniasis is a sexually transmitted infection (STI) caused by *Trichomonas vaginalis*. This infection if often undiagnosed because the infection is asymptomatic and can be cured, thus the countermeasures of this infection have not become the priority of public health program. In the other hand, trichomoniasis has some negative effects on pregnancy such as infertility, preterm birth, prematurity, and low birth-weight [1]. In addition, women who are infected by *T. vaginalis* have twice the risk to contract HIV, compared to women who do not have the infection [2].

Until recently, there have been only a few reports about trichomoniasis. The reports showed that the number of women who have trichomoniasis is increasing. Prevalence of sexually transmitted infections (STIs) in women age 25 to 45 years old is 29%. In Bali, data from Kusuma Buana foundation from 1987 to 1988 showed that the incidence of STIs in women who had an abortion are 16.3% for bacterial vaginosis, 15.5% for candidiasis, 7.3% for trichomoniasis, and 5.2% for chlamydia. A preliminary survey about the proportion of trichomoniasis in a private obstetric and gynecologic clinic showed that the proportion of women who have trichomoniasis during 3 months period (October to December 2010) is 14%, but in general, the prevalence of trichomoniasis among pregnant women in Bali is unknown.

Trichomoniasis infection is transmitted exclusively through sexual contact, although some study reported other routes of transmission such as sitting toilet, water, towel, and clothes. Therefore the infection is most likely to be found in those who switch sexual partner or have multiple sexual partners.

The preliminary study in a private clinic showed that 21.6% of women with trichomoniasis have partners who are working in commerce or tourism field. The age range was 16 to 48 years old. This age range is in the reproductive age range,

which means they might get pregnant, whether it is planned or unplanned. There is not much data about trichomoniasis among pregnant women, including in Bali province [3].

Based on the review above, this study is aimed to investigate the magnitude of trichomoniasis among pregnant women and the associated factors, in the city of Denpasar, Bali. The result of this study is expected to be a reference, in particular for the control and prevention of trichomoniasis and other STIs in general.

Materials and Methods

A cross-sectional study was conducted on 376 pregnant women, who were selected by using cluster sampling method. This study was conducted in Denpasar Timur I community health center, from April 2010 to April 2010. The subjects were pregnant women on her 1st and 2nd trimester. The pregnant women who live in the area covered by the community health service then were determined as the sample.

Each pregnant woman who has signed the written informed consent for this study was then interviewed so that data could be collected about the characteristics and risk factors of the trichomoniasis. Diagnosis of trichomoniasis was made by finding the protozoa in vaginal swab specimen which then confirmed by culture of the vaginal swab. Data were then analyzed in SPSS. For statistical analysis, Pearson chi-square test was used in this study.

Results

Three hundred and seventy-six pregnant women participated in this study; 28 pregnant women (7.4%) were tested positive for trichomoniasis as described in Table 1. The pregnant women who have trichomoniasis in this study mostly have a lower level of education and middle-class economic status (Table 2).

It is also found that most of the infected pregnant women wear nylon underwear, use river water as the main water source, use sitting toilet and practice vaginal douching. It is also mostly likely found in women who do not use a condom, who had a history of STIs, and who have intercourse frequency ≥ 3 times/week. Type of toilet used, vaginal douche practice and condom usage show significant association with trichomoniasis among pregnant women (p values were 0.001, 0.002 and 0.000 respectively) (Table 2).

Table 1: Characteristics of study participants and incidence distribution of trichomoniasis among pregnant women, in the city of Denpasar

Variables		N	%
Trichomoniasis			
	Positive	28	7.4
	Negative	348	92.6
Education			
	Elementary school	94	25
	Junior high school	134	35.7
	Senior high school	121	32.1
	University	27	7.1
Occupation			
	Housewives	67	17.9
	Entrepreneurs	40	10.7
	Private	81	21.4
	State employee	67	17.9
	Labour	54	14.3
	Commerce/trade	67	17.9
Socioeconomic status			
	Middle class	210	55.8
	Low class	166	44.2
Type of underwear			
	Undershirt	81	21.4
	Cotton	161	42.9
	Nylon	134	35.7
Vaginal douching			
	Yes	296	78.6
	No	80	21.4
Water source			
	Water utilities	121	32.1
	Well	228	60.7
	River water	27	7.1
Marriage status			

	Married	376	100
	Not married		0
Marriage frequency			
	1 time	376	100
	More than 1 time	0	0
History of STIs			
	Positive	255	67.9
	Negative	121	32.1
Sexual partners			
	1 person	362	96.4
	2 persons	14	3.6
Condom usage			
	Yes	27	7.1
	No	349	92.9
Frequency of intercourse			
	1 time/week	40	10.7
	2 times/week	148	39.3
	3 times/week	174	46.4
	> 3 times/week	14	3.6
Toilet type			
	Squatting	322	85.7
	Sitting	54	14.3

Table 2: Analysis of various characteristics of the study participants

Variables	Trichomoniasis				Total		X^2	P
	+ n=28		- n=56					
	n	%	n	%	n	%		
Educational level								
Lower	17	36.2	30	63.8	47	100	0.380	0.250
Higher	11	29.7	26	70.3	37	100		
Occupation								
Employee	14	36.8	24	63.2	38	100	0.384	0.349
Non-employee	14	30.4	32	69.6	46	100		
Socioeconomic status								
Middle class	16	39.1	25	60.1	41	100	1.167	0.198
Low class	12	27.9	31	72.9	43	100		
Type of underwear								
Undershirt	5	35.7	13	64.3	14	100	0.794	0.688
Cotton	12	31.6	26	68.4	38	100		
Nylon	11	39.3	17	60.7	28	100		
Vaginal douching								
Yes	22	47.8	24	52.2	46	100	0.746	0.002*
No	6	15.8	32	84.2	38	100		
Water source								
Water utilities	9	36	16	64	25	100	0.263	0.877
Well	17	29.3	37	70.7	58	100		
River water	2	40	3	60	5	100		
History of STIs								
Positive	9	39.1	14	60.9	23	100	0.472	0.329
Negative	19	31.1	42	68.9	61	100		
Number of sexual partners								
1 person	23	37.7	38	62.3	61	100	1.916	0.130
2 persons	5	21.7	18	78.3	23	100		
Condom usage								
Yes	2	2.2	43	97.8	45	100	36.400	0.000*
No	26	66.7	13	33.3	39	100		
Intercourse frequency								
<3 times/week	14	28	36	72	50	100	1.158	0.154
≥3 times/week	14	41.2	20	58.8	34	100		
Toilet type								
Squatting	4	12.5	28	87.5	52	100	10.056	0.001*
Sitting	24	46.2	28	53.8	32	100		

Discussion

Trichomoniasis is a sexually transmitted infection which caused by protozoa *Trichomonas vaginalis*, can occur both in men and women, and also can be cured.

High incidence of trichomoniasis makes it one of the public health problems. Trichomoniasis is also associated with poor pregnancy outcome, infertility, post-operative infection, and neoplasia of the cervix.

In African countries, the prevalence of trichomoniasis is around 5% to 74% in women and 5% to 29% in men, depends on the diagnostic tool used [2]. Trichomoniasis is associated with high morbidities in reproductive health, such as vaginitis, cervicitis, urethritis, and pelvic inflammatory disease (PID). In pregnancy, trichomoniasis is associated with poor pregnancy outcomes such as preterm delivery, premature rupture of the membrane, and low birth-weight [6].

The incidence of *T. vaginalis* infection in Denpasar-Bali is quite high (7.4%), even higher than worldwide incidence (2% to 46%). The global prevalence of trichomoniasis has been estimated at 8.1% for women [4]. In general, the incidence of *T. vaginalis* infection is high in sexually active women.

Community-based studies that have been conducted all across the globe showed that the prevalence of trichomoniasis in women is 2% to 46%. Clinic-based studies in women showed that the prevalence of *T. vaginalis* infection is 3% to 18% in the teenage clinic, 10% to 14% in the gynecologic clinic, and 2% to 18% in the STIs clinic [5]. High prevalence of *T. vaginalis* infection was found in female sex workers (22% to 25%). Using culture examination, the prevalence of *T. vaginalis* was found to be 10% to 18% in women visiting the prenatal clinic. High prevalence of the infection in pregnant women was also found upon using PCR method (20% to 28%) [6,7].

Previous studies also reported a high prevalence of trichomoniasis in pregnant women. Previous studies showed that the prevalence of trichomoniasis among pregnant women in Brazil is 7.7% and in Abeokuta Nigeria, it is 10.3% [8,9]. A study of pregnant women who attended public clinics in Mwanza City, North-western Tanzania also showed a high prevalence (10.4% were diagnosed from wet preparation and 23.0% were diagnosed from Giemsa staining) [10].

In this study, several factors were found to be associated with trichomoniasis among pregnant women. These factors are the type of toilet used, the practice of vaginal douching and condom usage.

In a previous study, it is reported that sharing bathroom, using public toilet, vaginal discharge, vaginal itching, vulva ulceration, and HIV and syphilis status were associated with trichomoniasis among pregnant women [10].

The previous study estimated that 50% to 70% individual infected by *T. vaginalis* were asymptomatic, thus making the awareness to get themselves checked is low [11].

Therefore, a lot of people with this infection are undiagnosed and the prevalence is unknown, especially in most developing countries. It is also challenging, that trichomoniasis has a much lower stigma compared to the other STIs, causing this disease to be underreporting. Therefore, the studies conducted upon this disease provide only a little information about the risk factors, led to lack of better understanding of the disease [12].

Human is the only host of *T. vaginalis*. There were 7.4 million new cases of STIs estimated in the USA recently. Despite the incidents is far above chlamydia and gonorrhea, trichomoniasis is not the public health priority due to underreporting. Epidemiologically, trichomoniasis usually associated with other STIs and is a marker of high-risk sexual activity.

Trichomoniasis often accompanied by other STIs; gonorrhea in particular. The majority of women with trichomoniasis also have bacterial vaginosis. Incidents of other STIs is higher in teenage and adolescent, while the incidence of trichomoniasis is more distributed throughout all age group of sexually active women, which then used as a marker for high-risk sexual behavior. The etiologic organism is exclusively transmitted through sexual contact. The incubation period is still unknown, although in vitro study reported the incubation period to be 4 to 28 days [3].

Prevention of trichomoniasis has not become the priority due to lack of knowledge of the implication of the disease and lack of human resources as well. Prevention and control of this infection need case reports and resources targeted for the screening of individual at risk.

Based on those findings, STIs examination in pregnant women should be performed upon a prenatal visit, as a first step of preventing STIs and *T. vaginalis* and the negative effects on pregnancy.

Conclusion

The incidence of *T. vaginalis* infection in pregnant women is 7.4%. The infection is most likely to be found in pregnant women who have a lower educational level, middle-class status and a history of STIs. It is also most likely if they do not practice vaginal douching if they do not use a condom during intercourse, if they have intercourse ≥3 times per week, and use sitting toilets. Type of toilet use, the practice of vaginal douching and condom usage show significant association with trichomoniasis among pregnant women. Based on those findings, it is suggested to every pregnant woman to undergo early detection of STIs to prevent poor impact in the future.

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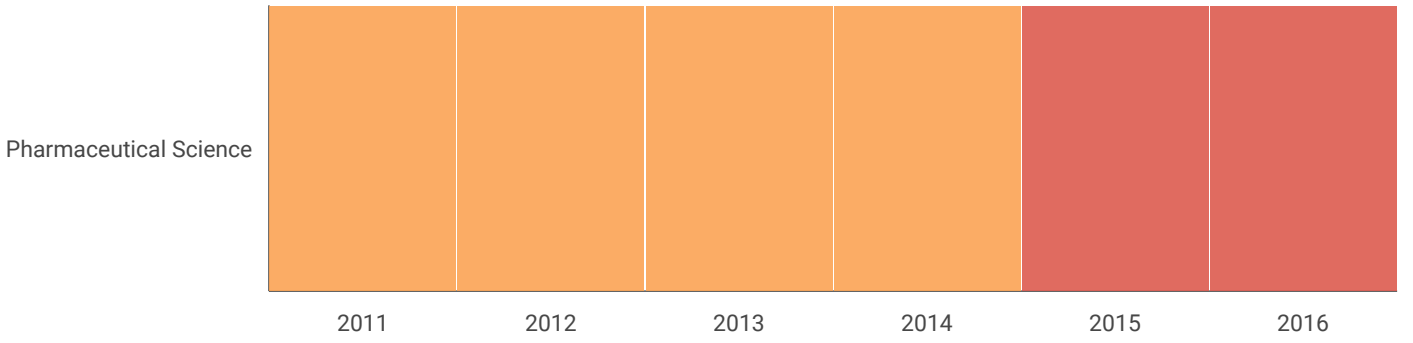

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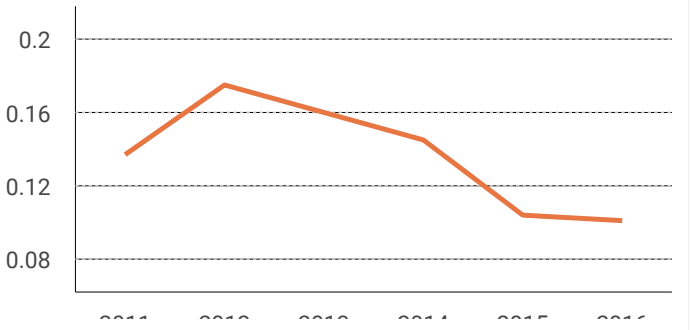

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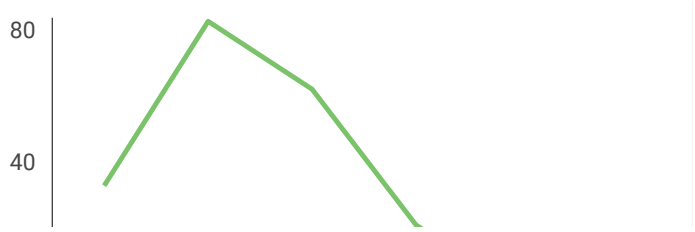

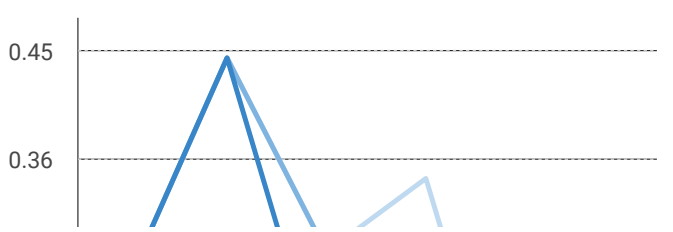

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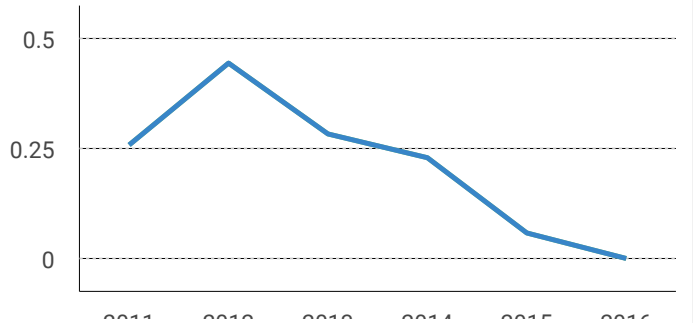

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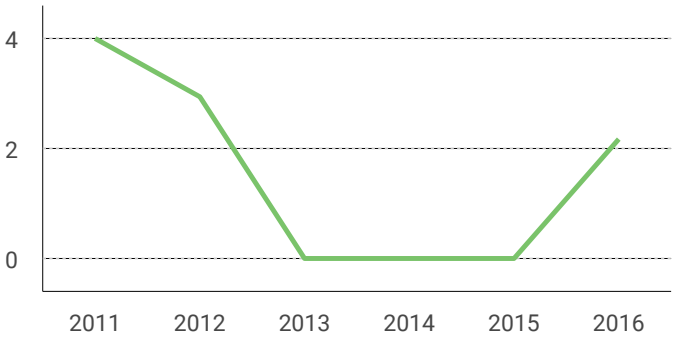

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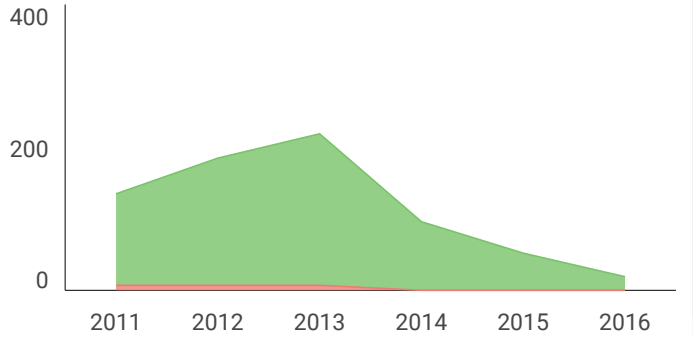

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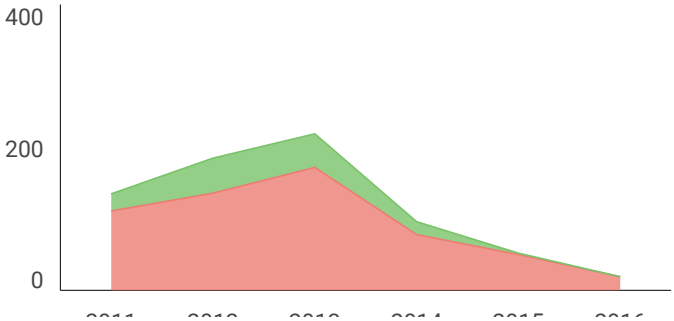

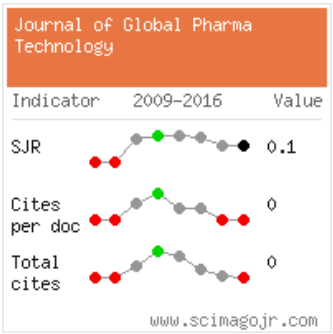

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