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Short Communication

Prevalence and Clinical Aspects of *Trichomonas vaginalis* Infection among High-Risk Women in Karaj, Iran

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Abstract

Background: Trichomoniasis is a common sexually transmitted infection (STI) caused by the protozoan *Trichomonas vaginalis,* which causes health and emotional damages to the sufferers annually. We aimed to investigate the prevalence of *T. vaginalis* and its related risk factors among the high-risk women in the city of Karaj, central Iran.

***Methods*:** This cross-sectional study was conducted between October 2021 and September 2022. In all 192 samples were taken from high-risk women referred to the center for vulnerable women and also from women in Fardis Prison of Karaj. All samples were examined by culture and microscopic method.

Results: The overall prevalence of *T. vaginalis* in high-risk women was estimated at 7.8% (15/192). Subgroup prevalence was also assessed according to the severity of symptoms, and no significant association was observed between the prevalence and the symptoms' severity.

Conclusion: Due to the high prevalence of the parasite among vulnerable/high-risk women, particularly in people with poor socioeconomic conditions, preventive health measures in this high-risk group seem necessary. Nevertheless, given that men have no symptoms but may be carriers of the parasite, the same study is also recommended for men.

Introduction

Trichomonas vaginalis a flagellated protozoan is the prevalent sexually transmitted diseases in the world. According to the latest annual statistics of the WHO, between the ages of 15 and 49 yr, approximately 156 million new cases of *T. vaginalis* infections have been introduced (1). The pooled prevalence of *T. vaginalis* in Iranian women was estimated at 4.30% in a recent comprehensive study (2).

Women infected by this parasite, in the acute phase, normally experience symptoms like yellow smelly frothy vaginal discharge along with itching, irritation, and frequent urination (3). However, in men, clinically it is usually asymptomatic and act as carriers of the disease (4). It can be transmitted through contaminated underwear, dirty public restroom, and swimming in infected waters and its latency period is between 4 -28 days (5). Parasites in women can cause vaginitis, urinary tract infection which is the infection of the cervix, and in men prostatitis. Trichomoniasis has been reported to be associated with infertility, abortion, regional pregnancy, and cervical cancer, hence, the surveillance of parasites is an important issue (6).

Even though many cases can be asymptomatic, knowing the prevalence is crucial because they can act as carriers and transmit it to other people who can show severe symptoms. Genital inflammation caused by *T. vaginalis* can lead to an increased risk of infection by HIV (7). Trichomoniasis in women infected with HIV can increase the risk of transmitting the virus and other immune deficiency diseases to their sexual partners (8). The definitive diagnosis of the parasite with wet smear, staining and cultivation in culture media such as Dorset at an early stage is possible.

Regarding easy sexual transmission of *T. vaginalis* and its importance, we have investigated the prevalence and associated risk factors of this protozoan parasite among the high-risk women in Karaj, Iran.

Methods

The study was conducted between October 2021 and September 2022. Overall, 192 samples were taken from high-risk women referred to the center for vulnerable women and also from women in Fardis Prison of Karaj with the consent.

Albourx University of Medical sciences approved the study (Ethical approval code: IR.ABZUMS.REC.1393.43-2406179) Informed consent was taken from the participants before the study.

A midwife checked the patients' vaginal condition and secretion and collected the two specimens with wooden spatula from exocervix and vagina wall, as well as questionnaire including personal data, socio-economic and health status for each participant was filled out. One of the samples transferred in to a tube contained 1 mL of the ringer for direct observation and another one was placed into the tube containing Dorset medium and was then transferred to the laboratory. From the samples in Ringer, wet smear, were prepared and investigated by a light microscope. The presence of *T. vaginalis* movements with 400X magnification was approval for diagnosis, and other tubes containing medium with samples were incubate at 37 ºC to go under investigation 24 h. In case of negative results for samples in culture media, they were stored for a week and observed every day. The results were analyzed using SPSS 21.0 (IBM Corp., Armonk, NY, USA) statistical software, and the significance level was considered 0.05.

Results

The characteristics of the participants are presented in Table 1. Overall, prevalence of trichomoniasis among the high-risk study population was 7.8% (15/192) (Table 2). 68.75% (132/192) of women had no symptoms or mild symptoms (21.5%) (41/192),

and 5.8% (11/192) had moderate as well as 4.1% (8/192) had severe symptoms; no association was observed between positive samples and symptoms severity. Only 2% of women who had sex more than twice a week was reported severe symptoms. However, 47.6% (91/192) had no symptom, and just had one sex partner; 2.6% of women who had more than two sex partners had no clinical symptoms, and no statistically significant association was seen between the disease and the number of sexual partners (Table 2). The prevalence of the disease for the age ranges under 20, 21-34, and more than 34 years was 6.7%, 33%, and 60%, respectively. As a result, positive samples in direct wet smear test were positive only by 5%, while 7.8 % were positive for culture method, revealing the specificity and sensitivity of culture compared to direct smear.

Table 1: Clinical characteristics of patients included in the study

Symptoms	*Cervicitis vaginitis*	*(Dysuria, vaginal irritation, itching)*	*Strawberry syndrome*	*Vaginitis*	*Unpleasant intercourse*	*Total*
No signs	-	-	-	-	-	68.75% (132/192)
Mild	-	8	1	-	32/41	21.5% (41/192)
Moderate		2	1	1	7	5.8% (11/192)
Severe	1	2	2	1	2	4.1% (8/192)

Table 2: Prevalence based on sex times in week/number of sexual partners and severity of clinical symptoms in the subjects

Variables	*Symptoms*				*Total No (%)*	*P-value*
	No sign	**Mild**	**Moderate**	**Severe**		
Total Positive cases	2	3	6	4	15 (100)	0.08
Sexual partner(s)						
One	1	-	-	1	2 (13.3)	0.06
Two	1	-	1	1	3 (20)	
More than two	-	3	5	2	10 (66.7)	
Nothing	-	-	-	-		
Sex Times						
Once a week	1	1	2	1	5 (33.3)	0.31
Twice a week	1	1	3	2	7 (46.7)	
More than twice a week	-	1	1	1	3 (20)	
Age groups(yr)						
<20	1	-	0	2	3 (20)	0.26
20-34	-	3	2	1	6 (40)	
35<	1	-	4	1	6 (40)	
Diagnostic method						
Wet smear			10		10 (66.7)	0.05
Dorset Medium culture			15		15 (100)	

Discussion

T. vaginalis has been suggested as a health problem in communities, especially in women, and the importance of this sexually transmitted infection (STI) is doubled in high-risk

women. According to the results of present study, the prevalence of *T. vaginalis* among 192 high-risk women referred to the health center of vulnerable women and Fardis Penitentiary Center (prison) was estimated at 5% and 7.8% for microscopic and culture (Dorset) methods, respectively.

High-risk women are in shadow population in some geographical areas, such as the Middle East (9). High-risk women generally include addicted women, sex workers, and prisoners. Sex workers are illegal in these areas, and less attention is paid to the hidden population of vulnerable women and prisoners. Limited studies have been performed on high-risk women in Iran (9). In a study in Iran, using the molecular method to diagnose the infectious agent, the prevalence of *T. vaginalis* was 11.9%, (10). This is in line with our results and the difference in prevalence is probably due to the high sensitivity and specificity of the molecular method.

Overall 5% with wet smear and 7.8% with culture method (Dorset) showed positive results and confirmed the superiority of culture methods to the wet smear. The global prevalence of *T. vaginalis* in female sex workers (FSWs) as a high-risk women is estimated at 15%, 16%, and 22% for microscopic (wet mount), culture and molecular methods, respectively; which indicates the high prevalence of this parasite in FSWs (11). Compared to the results of the present study, FSWs are more likely to be more prevalent than other high-risk women such as prisoners due to the high number of clients and poor sanitation.

The highest prevalence was reported in the age range of 30 to 36 years (20%), which is due to the high sexual activity of women in these ages. In contrast, Crucitti et al.'s study showed that the prevalence of this parasite increases with age, so that the prevalence was estimated at 24.6% in adolescents, 32.2% in pregnant women and 33.2% during sex worker; there was no statistically significant difference between the prevalence in pregnant women and sex workers (12). The prevalence of *T. vaginalis* in the geographical area of Iran was about 8%, which confirms the present study results (13).

Our results indicate a lower prevalence of parasites in Iran than in many parts of the world. This difference could be due to the cultural differences in this geographical area, because in Iran, as a Muslim country, high-risk sexual behaviors are illegal. Scattered studies from Iran in different populations of women are available until now. In a recent comprehensive study, the prevalence of *T. vaginalis* in the general population of Iranian women was estimated at 4.3% (2). Comparison with the present study shows that the prevalence of this parasite is slightly higher in high-risk women. In a previous review study, the prevalence of *T. vaginalis* in the Iranian population was estimated in the range of 0.4 to 42% according to epidemiological conditions (14); while the prevalence conditions in the general population are not the same as those of women at risk. People with *T. vaginalis* are 1.5 times more likely to acquire HIV than non-infected people (15, 16).

In our study we found that due to the high protection level of primary health care systems in Iran for at risk women like sex workers and public awareness the incidence of this parasite in recent years registered patient of these centers are in control. The prevalence of this parasite among women, especially among vulnerable women and women with weakened immune systems, is of particular importance and can be associated with gynecological and even the incidence and risk of more dangerous diseases such as cervical cancer.

Conclusion

The prevalence of the infection rate in high-risk population is much more than the healthy ones. There was no relationship between the prevalence and number of sexual partners, and clinical symptoms. *T. vaginalis* infection rate among cases with the poor socioeconomic

condition was higher; these people even can play an important role for maintenance of disease in the community. However, given that men have no symptoms but may be carriers of the parasite, the same study is also recommended for men

Conflicts of Interests

The authors declare no conflict of interest.

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