



Original Article



# Prevalence of Trichomoniasis in Women Attending Health Centers in Asadabad City, West of Iran, During 2021-2022

Ali Azimi Kohn<sup>1</sup>, Faeze Foroughi-Parvar<sup>2</sup>, Sepehr Matini<sup>1,3</sup>, Mohammad Matini<sup>2\*</sup>

<sup>1</sup>Students Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

<sup>2</sup>Department of Medical Parasitology and Mycology, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran

<sup>3</sup>Lorestan University of Medical Sciences, Khorramabad, Iran

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## \*Corresponding author:

Mohammad Matini,  
Email: [matini@umsha.ac.ir](mailto:matini@umsha.ac.ir)

## Abstract

**Background:** Trichomonal vaginitis or trichomoniasis is one of the most common non-viral sexually transmitted infections (STIs) in the world, which has significant health consequences. The purpose of this study was to determine the prevalence of this infection in women of Asadabad city and to investigate its epidemiological factors.

**Methods:** In this study, 291 women referred to health centers in Asadabad were examined for *Trichomonas vaginalis* infection by parasitological methods. The data were analyzed by chi-square test.

**Results:** Out of 291 women, 7 (2.4%, with 95% confidence interval: 0.7-4.1%) were infected with *T. vaginalis*. Seven people were diagnosed by culture method and 4 people were diagnosed by direct smear method. The age of participants ranged from 19 to 65 years with an average of 38.2 years. The age group of 29-38 years old was the most infected group with 4 cases of infection. Their education level ranged from illiterate to university education. Considering marriage and occupation, 97.5% were married and 91.1% were housewives. The most common clinical signs and symptoms observed in people infected with *T. vaginalis* were vaginal discharge and pain in the lower abdomen. There was no statistically significant relationship between trichomoniasis and any of the studied variables ( $P > 0.05$ ).

**Conclusion:** The results of this study show a relatively low prevalence of trichomonal vaginitis in this region. However considering the health importance of the infection in the community, it is expected that effective measures will be taken to improve people's awareness and public health.

**Keywords:** *Trichomonas vaginalis*, Epidemiology, Women, Iran



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## Introduction

*Trichomonas vaginalis* (Trichomonadidae) is a flagellated protozoan that lives in the human urogenital tract. There is no cyst stage in the life cycle of this parasite and it is directly transmitted from one person to another through sexual contact. Trichomonal vaginitis (trichomoniasis), caused by *T. vaginalis*, is often seen as an asymptomatic infection in women of childbearing age. Reports indicate that 25% to 50% of infected women have no clinical symptoms. Trichomoniasis has a global spread and according to the World Health Organization, its prevalence rate is 5.3% with an annual occurrence of 156 million cases worldwide (1-3). The prevalence of trichomoniasis has been reported to be higher in women (8.1%) than in men (1%) (4).

In addition to vaginitis and cervicitis, trichomoniasis can be associated with complications during pregnancy such as preterm delivery and low birthweight. Additionally, it

can increase the possibility of cervical cancer and pelvic inflammatory diseases in women. Trichomoniasis in men is usually asymptomatic, but it can be an important cause of non-gonococcal urethritis in men. Additionally, this parasite can cause prostatitis and epididymitis, and it is also known as a cause of temporary infertility. In recent years, trichomoniasis has received more attention as a public health concern. This is due to the role of the infection in increasing the chance of infection and transmission of human immunodeficiency virus (HIV) in *T. vaginalis*-infected individuals, especially in women (4-7).

Another health concern related to trichomoniasis is treatment failure and resistance of the parasite to metronidazole. Some estimates indicate an increasing resistance of the parasite to 5-nitroimidazole compounds. According to the Center for Disease Control and Prevention, the rate of resistance of *T. vaginalis* to



metronidazole ranges from 2% to 5% in the United States, however, some studies have reported a resistance rate of between 2% and 13% (7-9). Therefore, considering the health importance of trichomoniasis in society and the need to understand the epidemiological aspects of this infection, the present study was conducted in Asadabad city to investigate the prevalence of trichomoniasis as well as the factors involved in its transmission in this region.

### Materials and Methods

This descriptive cross-sectional study was approved by the Ethics Committee of Hamadan University of Medical Sciences (IR.UMSHA.REC.1399.849). Sample collection was carried out from December 2021 to June 2022 using available sampling method. Vaginal swab samples were obtained from 291 women admitted to obstetrics and gynecology clinics in Asadabad city in Hamadan province. After obtaining informed consent, people were asked questions about demographic characteristics and clinical symptoms of trichomoniasis and the data were recorded. Sampling was done by clinicians using a cotton swab from the posterior fornix of the vagina. Two swab samples were taken from the participants. One sample was placed in a sterile tube with a screw cap containing 0.5 mL of Ringer's solution and 5% glucose for wet mount preparation and the other was taken for culture in Dorset medium. To prevent immobilization of *T. vaginalis* trophozoites and rapid diagnosis of the parasite, the samples were transferred to the reference laboratory in Asadabad Medical School within a short period of time. The sediment of the samples was immediately examined with a light microscope at 100X and 400X magnifications to observe motile flagellated trophozoites. The Dorset culture medium was incubated at 37 °C and examined daily for 72 hours (10).

Data were analyzed using SPSS 16.0 and chi-square test, and a probability value (*P* value) of less than 0.05 was considered as the significance level.

### Results

Out of 291 women, 7 (2.4%, 95% CI: 0.7-4.1%) were infected with *T. vaginalis*. Seven positive samples were detected by the culture method and 4 positive samples were detected by the direct wet mount method. The sensitivity of the wet mount method was 57%. The age of the women ranged from 19 to 65 years with an average of 38.2 years. The majority of the participants were in the age group of 29-38 years (40.2%) with the highest rate of infection (4 cases). The education level of the participants ranged from illiterate to college education and the infection was found in all educational groups. Considering marriage and occupation, 97.5% were married and 91.1% were housewives, and all cases of trichomonal vaginitis were observed in these groups. Other demographic characteristics of the participants are presented in Table 1. The most prevalent clinical signs and symptoms in women infected with *T. vaginalis* were vaginal discharge and

**Table 1.** Socio-demographic Characteristics of Women Attending Health Centers in Asadabad City, 2021-2022

Variables	Trichomonal Vaginitis			P value
	Positive No (%)	Negative No (%)	Total No (%)	
<b>Age (y)</b>				
19-28	0 (0)	51 (100)	51 (17.5)	0.234
29-38	4(3.4)	113 (96.6)	117 (40.2)	
39-48	2 (2.4)	82 (97.6)	84 ( 28.9)	
≥49	1(2.6)	38(97.4)	39 (13.4)	
<b>Education</b>				
Illiterate	1 (2.6)	37 (97.4)	38 (13.1)	0.836
Primary school	3 (2.4)	121 (97.6)	124 (42.6)	
Junior high school	2 (2.1)	94 (97.9)	96 (33)	
College education	1 (3)	32 (97)	33 (11.3)	
<b>Occupation</b>				
Housewife	7 (2.6)	258 (97.4)	265 (91.1)	0.516
Employee	0 (0)	19 (100)	19 (6.5)	
Other	0 (0)	7 (100)	7 (2.4)	
<b>Husband's job</b>				
Worker	2 (2)	97 (98)	99 (34)	0.378
Employed	1 (2.3)	43 (97.7)	44 (15.2)	
Driver	1 (2)	8 (98)	49 (16.8)	
Other	3 (3)	96 (97)	99 (34)	
<b>Residency</b>				
Urban	5 (2.7)	183 (97.3)	188 (64.6)	0.523
Rural	2 (1.9)	101 (98.1)	103 (35.4)	
<b>Contraceptive methods</b>				
Oral contraceptive pills	0 (0)	41 (100)	41 (14.1)	0.521
Condoms	1 (2)	48 (98)	49 (16.8)	
Other	3 (3.3)	88 (96.7)	91 (31.3)	
None	3 (2.7)	107 (97.3)	110 (37.8)	
<b>Fertility status</b>				
Fertile	7 (2.5)	276 (97.5)	283 (97.3)	0.821
Infertile	0 (0)	8 (2.8)	8 (2.7)	

pain in the lower abdomen, which were reported in 5 people. Moreover, 4 of the infected individuals had abnormal discharge in terms of color and consistency. Other symptoms included dyspareunia, vaginal burning, and painful urination, which were observed in 2 cases. Additionally, vaginal itching was observed in 1 case. The relationship between trichomoniasis and the investigated variables was not statistically significant ( $P > 0.05$ ).

### Discussion

Most women experience at least one episode of vaginitis during their lifetime, which is accompanied by unpleasant symptoms such as vaginal discharge, itching, and burning of the vulva. Various pathogens, including viruses, fungi, bacteria, and *T. vaginalis* protozoa can cause this disease. Trichomoniasis is the most common non-viral sexually transmitted infection (STI) in the world; therefore, its

prevalence is considerable among high-risk groups. Today, due to the role of this infection in the epidemiology of HIV infection, its public health importance has become more obvious (2,8,11).

In the present study, the prevalence of trichomonal vaginitis in Asadabad was estimated to be 2.4% and no significant relationship was observed between trichomoniasis and the studied variables. In this study, the highest rate of prevalence was observed in the age group of 28-39 years. The highest prevalence of infection has been observed in the age range of 25 to 45 years, when people are more sexually active (12-18).

In Hamadan province, comprehensive studies have been conducted regarding this infection. Studies conducted in Hamadan city since 2005 have reported that the prevalence rate of the infection ranged from 0.6% to 2.2% (2,10,12,13). The lowest prevalence rate (0.6%) was observed among pregnant women (2). In this latter study, which was conducted in 2015, urine samples were used to detect *Trichomonas* infection (2). *T. vaginalis* resides in the urinary-genital tract and can be seen in the urine sediment, but the urine sample has lower diagnostic sensitivity compared to vaginal discharge. Therefore, this issue can be one of the reasons for the low prevalence of infection in pregnant women in this region. In a molecular epidemiological study conducted in Hamedan, the prevalence rate was 4.7% in men; however, the parasitological methods were not able to detect the parasite in men (14). The lowest prevalence rate in Hamadan province was reported to belong to Bahar city with a prevalence rate of 0.5% (15). These studies did not demonstrate a significant relationship between trichomoniasis and the possible risk factors. However, one study reported a significant relationship between education level and trichomoniasis (13). In a study conducted in 2015 in Ghorveh city in Kurdistan province, the prevalence of trichomonal vaginitis was determined to be 1.2%. In this research, a significant relationship was observed between infection and education level (16). In Iran, comprehensive studies have been conducted on the prevalence of female trichomoniasis. In a systematic review conducted by Ziaei Hezarjaribi et al, the prevalence of trichomoniasis in Iran was reported to be 8%. In this review study, the studies conducted from 1992 to 2012 in Iran were included (17). In another review study that examined studies conducted from 1992 to 2017, the prevalence of trichomoniasis in Iran was reported to be between 0.4% and 42% (19).

The main risk factors involved in STIs include lack of public health awareness, high-risk sexual behaviors, multiple sexual partners, socio-cultural factors, age, and so on. On the other hand, study design and sample size are other important factors that can affect the significant relationship between epidemiological variables and STIs. Due to the cultural issues in the country, the prevalence of trichomonas in Iran is lower compared to other regions of the world. However, studies conducted in Iran show a

wide range of prevalence rates probably due to differences in the method of diagnosis and the populations being studied.

## Conclusion

The results of this study show a relatively low prevalence of trichomoniasis in this region of the country. However, due to the role of this infection in the epidemiology of other STIs, it is expected that effective measures will be taken to promote sexual health and sexual education in the society.

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## Authors' Contribution

**Conceptualization:** Faeze Foroughi-Parvar, Mohammad Matini.

**Methodology:** Mohammad Matini, Faeze Foroughi-Parvar.

**Formal analysis:** Mohammad Matini, Ali Azimi Kohn, Sepehr Matini.

**Funding acquisition:** Mohammad Matini.

**Investigation:** Ali Azimi Kohn, Sepehr Matini.

**Project administration:** Mohammad Matini.

**Resources:** Mohammad Matini.

**Data curation:** Mohammad Matini, Ali Azimi Kohn.

**Visualization:** Mohammad Matini, Faeze Foroughi-Parvar.

**Supervision:** Mohammad Matini, Faeze Foroughi-Parvar.

**Writing—original draft:** Ali Azimi Kohn.

**Writing—review & editing:** Mohammad Matini, Faeze Foroughi-Parvar.

## Competing Interests

The authors declare no conflict of interests.

## Ethical Approval

This study was approved by the Research Ethics Committee of Hamadan University of Medical Sciences (IR.UMSHA.REC.1399.849).

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## References

1. Kissinger P. *Trichomonas vaginalis*: a review of epidemiologic, clinical and treatment issues. *BMC Infect Dis.* 2015;15:307. doi: 10.1186/s12879-015-1055-0.
2. Akbari Z, Matini M. The study of trichomoniasis in pregnant women attending Hamadan city health centers in 2015. *Avicenna J Clin Microbiol Infect.* 2017;4(2):41533. doi: 10.5812/ajcmi.41533.
3. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ.* 2019;97(8):548-62p. doi: 10.2471/blt.18.228486.
4. World Health Organization (WHO). Global prevalence and incidence of selected curable sexually transmitted infections: overviews and estimates. In: WHO/ HIV/AIDS. Edited by Organization WH. Geneva; 2001.

5. Cudmore SL, Delgaty KL, Hayward-McClelland SF, Petrin DP, Garber GE. Treatment of infections caused by metronidazole-resistant *Trichomonas vaginalis*. Clin Microbiol Rev. 2004;17(4):783-93. doi: [10.1128/cmr.17.4.783-793.2004](https://doi.org/10.1128/cmr.17.4.783-793.2004).
6. Kissinger P, Adamski A. Trichomoniasis and HIV interactions: a review. Sex Transm Infect. 2013;89(6):426-33. doi: [10.1136/sextrans-2012-051005](https://doi.org/10.1136/sextrans-2012-051005).
7. Mabaso N, Abbai NS. A review on *Trichomonas vaginalis* infections in women from Africa. S Afr J Infect Dis. 2021;36(1):254. doi: [10.4102/sajid.v36i1.254](https://doi.org/10.4102/sajid.v36i1.254).
8. Workowski KA, Berman SM. Centers for Disease Control and Prevention sexually transmitted disease treatment guidelines. Clin Infect Dis. 2011;53(Suppl 3):S59-63. doi: [10.1093/cid/cir694](https://doi.org/10.1093/cid/cir694).
9. Matini M, Maghsood AH, Mohebbali M, Rabiee S, Fallah M, Rezaie S, et al. In vitro susceptibility of Iranian isolates of *Trichomonas vaginalis* to metronidazole. Iran J Parasitol. 2016;11(1):46-51.
10. Matini M, Rezaie S, Mohebbali M, Maghsood A, Rabiee S, Fallah M, et al. Prevalence of *Trichomonas vaginalis* infection in Hamadan city, western Iran. Iran J Parasitol. 2012;7(2):67-72.
11. Yarizadeh M, Taherkhani H, Amir-Zargar MA, Matini M. Molecular epidemiologic study of male trichomoniasis in Hamadan, western Iran. Iran J Parasitol. 2021;16(2):245-52. doi: [10.18502/ijpa.v16i2.6282](https://doi.org/10.18502/ijpa.v16i2.6282).
12. Rabiee S, Fallah M, Zahabi F. Frequency of trichomoniasis in patients admitted to outpatient clinics in Hamadan (2007) and relationship between clinical diagnosis and laboratory findings. J Res Health Sci. 2010;10(1):31-5.
13. Matini M, Rezaei H, Fallah M, Maghsood AH, Saidijam M, Shamsi-Ehsan T. Genotyping, drug susceptibility and prevalence survey of *Trichomonas vaginalis* among women attending gynecology clinics in Hamadan, western Iran, in 2014-2015. Iran J Parasitol. 2017;12(1):29-37.
14. Yarizadeh M, Taherkhani H, Amir-Zargar MA, Matini M. Molecular epidemiologic study of male trichomoniasis in Hamadan, western Iran. Iran J Parasitol. 2021;16(2):245-52. doi: [10.18502/ijpa.v16i2.6282](https://doi.org/10.18502/ijpa.v16i2.6282).
15. Morshedloo L, Fallah M, Maghsood AH, Matini M. Study of *Trichomonas vaginalis* infection in women visiting health centers in bahar city and determination of metronidazole susceptibility of the isolated parasites. Avicenna J Clin Med. 2018;24(4):315-21. doi: [10.21859/ajcm.24.4.315](https://doi.org/10.21859/ajcm.24.4.315). [Persian].
16. Matini M, Golmoradi K, Maghsood AH, Fallah M. The prevalence of trichomoniasis and metronidazole susceptibility of the isolates in Ghorveh city, year 2015. Sci J Hamadan Univ Med Sci. 2016;23(3):185-92. doi: [10.21859/hums-23032](https://doi.org/10.21859/hums-23032). [Persian].
17. Ziaei Hezarjaribi H, Fakhari M, Shokri A, Hosseini Teshnizi S, Sadough A, Taghavi M. *Trichomonas vaginalis* infection among Iranian general population of women: a systematic review and meta-analysis. Parasitol Res. 2015;114(4):1291-300. doi: [10.1007/s00436-015-4393-3](https://doi.org/10.1007/s00436-015-4393-3).
18. Chalechale A, Karimi I. The prevalence of *Trichomonas vaginalis* infection among patients that presented to hospitals in the Kermanshah district of Iran in 2006 and 2007. Turk J Med Sci. 2010;40(6):971-5. doi: [10.3906/sag-0906-18](https://doi.org/10.3906/sag-0906-18).
19. Arbabi M, Delavari M, Fakhrieh-Kashan Z, Hooshyar H. Review of *Trichomonas vaginalis* in Iran, based on epidemiological situation. J Reprod Infertil. 2018;19(2):82-8.