

# The Study of Trichomoniasis in Pregnant Women Attending Hamadan City Health Centers in 2015

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## Abstract

**Background:** Trichomoniasis is one of the most non-viral sexually transmitted diseases worldwide that causes some complications such as adverse pregnancy outcomes.

**Objectives:** The aim of this study was to determine the frequency of *Trichomonas vaginalis* infection among pregnant women in Hamadan, west of Iran.

**Methods:** This study was conducted on 1200 pregnant women attending the Hamadan city health centers in 2015. After gathering socio-demographic characteristics and clinical signs and symptoms of the women, first-voided morning urine was collected from the all participants and subjected to sediment wet-mount preparations and Dorset culture medium for detection of *T. vaginalis*. Data analysis was done using descriptive statistics and chi-square test.

**Results:** *T. vaginalis* was diagnosed in 0.6% (7/1200) of the urine samples using two parasitological methods. Dorset culture medium and direct wet-mount examination of the urine sediments were positive in 7 (0.6%) and 4 (0.3%) samples, respectively. There was no relationship between trichomoniasis and age, education, occupation, place of living, husband's job, and history of contraceptive methods ( $P > 0.05$ ).

**Conclusions:** The results demonstrated the rate of *T. vaginalis* infection in pregnant women is relatively low in the area but, because of the importance of this issue in pregnant women, it can be substantial during antenatal care.

**Keywords:** Iran, Prevalence, Pregnant Women, *Trichomonas vaginalis*

## 1. Background

*Trichomonas vaginalis* is a flagellated protozoan parasite causing trichomoniasis, a sexually transmitted infection (STI), with worldwide distribution (1-3). Though up to 25 to 50% of trichomoniasis in women is asymptomatic (3), the infection can lead to significant complications such as adverse pregnancy outcomes, pelvic inflammatory disease, and cervical neoplasia in women and infertility in men (4-7). Premature rupture of membranes, preterm labor, and low birth weight are the serious complications of trichomoniasis in pregnancy (2). Urogenital infection with *T. vaginalis* may occur in female newborn infants when passing through the birth canal (3). Trichomoniasis can occur in both men and women, but men infected with *T. vaginalis* are mainly asymptomatic and the signs of the infection are not well characterized although nongonococcal urethritis, prostatitis, epididymitis, and other lower urogenital tract problems may be observed (3).

Lately, *T. vaginalis* infection has been further considered because of its enhancing role in the social dynamics of HIV transmission (1, 8). Trichomoniasis increases the risk of HIV infection by at least two times by increasing HIV vi-

ral shedding up to four times (9).

Infection with *T. vaginalis* is the most common non-viral STI with an annual incidence of 276.4 million cases worldwide that is more frequent than other sexually transmitted diseases (STDs) such as gonorrhea, syphilis, and Chlamydia infection (10). A high prevalence of the infection is observed in both developed and developing societies such as 7.4 million new cases in the United States and 30 million new cases in sub-Saharan Africa per year (2, 11). In Iran, the prevalence of *T. vaginalis* infection ranges from 2% to 8% and even up to 30% at high-risk groups (12).

## 2. Objectives

Despite of the importance of trichomoniasis and its role in the course and outcome of pregnancy, there is little information about the prevalence of the infection among pregnant women in this area and generally in Iran. Thus, the study was conducted to estimate the frequency of *T. vaginalis* infection and its association with demographic and epidemiological characteristics within this sensitive group.

### 3. Methods

#### 3.1. Patients, Samples Collection and Procedures

This descriptive cross-sectional study was conducted to evaluate the prevalence of trichomoniasis in parturient women attending the Hamadan city health centers, affiliated to Hamadan University of Medical Sciences. The study was approved by the Research ethics committee of the Hamadan University of Medical Sciences with approval number IR.UMSHA.REC.1394.342. A total of 1200 pregnant women who referred for routine prenatal care service were enrolled in 2015. The persons who had received oral or vaginal antibiotic therapy in the preceding two weeks were not included in the study.

At first, an informed consent was received from the all participants. Then, socio-demographic characteristics (age, education, job, marital and residency status, and husband's occupation), clinical symptoms (vaginal discharge, appearance of discharge such as color and viscosity), and patients' complaints (irritation, itching, burning, dyspareunia, and frequent urination) were collected through interviews.

During routine prenatal tests, the participants were asked to provide first-catch urine sample because of maximum concentration of the parasite in the first portion of urine. Within a short time after sampling, the specimens were transferred to the parasitology research laboratory of Hamadan University of Medical Sciences and spun at  $1000 \times g$  for 5 minutes. The supernatant was decanted and the pellet was resuspended in  $250 \mu\text{L}$  of sterile distilled water. A drop of the resuspended sediment was put on a clean glass slide covered by coverslip  $18 \times 18$  mm and then, motile trichomonads was detected by light microscope under low ( $100 \times$ ) and high ( $400 \times$ ) magnifications (13). The residue of the sediment was subjected to Dorset culture medium incubated at  $35.5^\circ\text{C}$  examined daily until they turned positive or up to seven days as explained previously (14).

#### 3.2. Statistical Data Analysis

Descriptive statistics and chi-square test ( $\chi^2$ ) or Fisher exact test were applied for data analysis by using SPSS statistical software, version 16. Statistical significance was reported when a P-value had been less than 0.05.

### 4. Results

7 out of 1200 (0.6%) urine samples analyzed for *T. vaginalis* parasite were positive by Dorset culture medium. Direct wet-mount examination of the urine sediments showed *T. vaginalis* in 4 samples (0.3%). Direct wet-mount

examination of the urine sediments was positive in 4 samples (0.3%). The age of the participants was between 15 and 44 years and the highest rate of the infected pregnant women was found in the 25 - 34-year age group (57%). Women with a high school education had the highest frequency in the sample and 42.8% of the infected women with trichomoniasis were observed in this group. 4 (57%) and 3 (43%) of the infected pregnant women were living in rural and urban areas, respectively. All of individuals (28.3%) with history of using condom as contraceptive method were negative for trichomoniasis. One of the infected women had a history of abortion and the rest without any record. Table 1 shows more information about the participants. Vaginal discharge was the most common complaint and the others included dyspareunia, dysuria, genital itch, irritation, and lower abdominal pain (Table 2). There were no statistically significant correlations between trichomoniasis and study variables.

### 5. Discussion

The majority of women suffer from at least one episode of vaginitis distinguished by some unpleasant symptoms such as vaginal discharge, vulvar itching and/or odor, during their life. Different types of pathogens can cause vaginitis in women including viral agents such as herpes simplex virus, pathogenic fungi especially *Candida* species, bacterial species such as *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus* sp., and several fastidious or uncultivated anaerobes and finally *T. vaginalis*, a flagellated protozoan parasite (15). Infection with *T. vaginalis* causes urogenital trichomoniasis, the most prevalent non-viral STD over the world. Prevalence rate of the infection is reported high in developing countries and also among high-risk groups in developed countries. Trichomoniasis was used to consider as an inconsequential infection but lately, it has attracted more attention because of its co-factor role in HIV spread and acquisition of other STIs, predisposition to cervical and prostate cancer, premature rupture of the placental membrane, and other complications (1-7).

Over 30 microbial agents can be transmitted sexually. Because of the importance of this issue, extensive strategic planning and appropriate interventions are required to control STIs in the world. In 2008, the prevalence of trichomoniasis was estimated by WHO to be about 276.4 million cases in 15 - 49 year-old people. In accordance with this document, regional estimates of the burden of trichomoniasis are 42.8 million in Africa including 46 countries, 57.8 million in America comprising 35 countries including North America, 28.7 million in South-East Asia involving 11 countries, 14.3 million in European including 53 countries, 13.2 million in Eastern Mediterranean region including 23

**Table 1.** Demographic Characteristics of Pregnant Women Participating in the Present Study<sup>a</sup>

Characteristics	Trichomoniasis Positive	Trichomoniasis Negative	Total No.	P Value
<b>Age, y</b>				0.912
15- 24	2 (0.5)	398 (99.5)	400	
25 - 34	4 (0.6)	677 (99.4)	681	
35 - 44	1 (0.8)	118 (99.2)	119	
<b>Education</b>				0.67
Illiterate	0	33 (100.00)	33	
Primary	3 (1.1)	278 (98.9)	281	
Secondary	1 (0.3)	314 (99.7)	315	
High school	3 (0.7)	462(99.3)	465	
College	0	106 (100.00)	106	
<b>Occupation</b>				1
Housekeeping	7 (0.6)	1169 (99.4)	1176	
Official job	0	24 (100.00)	24	
<b>History of using contraceptive methods</b>				0.095
Oral contraceptives	5 (0.9)	539 (99.1)	544	
Condom	0	340 (100)	340	
None	2 (1.6)	124 (98.4)	126	
Others	0	190 (100)	190	

<sup>a</sup>Values are expressed as No. (%).

**Table 2.** Frequency of Signs and Symptoms Reported by Pregnant Women Participating in the Present Study<sup>a</sup>

Signs and Symptoms	With Symptoms		Without Symptoms	
	Trichomonas Negative	Trichomonas Positive	Trichomonas Negative	Trichomonas Positive
<b>Vaginal discharge</b>	1025 (86)	7 (100)	168 (14)	0
<b>Dyspareunia</b>	891 (74.8)	3 (43)	302 (25.2)	4 (57)
<b>Dysuria</b>	875 (73.5)	3 (43)	318 (26.5)	4 (57)
<b>Genital itch</b>	826 (69.4)	3 (43)	367 (30.6)	4 (57)
<b>Irritation</b>	822 (69.1)	2 (29)	371 (30.9)	5 (71)
<b>Lower abdominal pain</b>	261 (22.3)	1 (14.3)	932 (77.7)	6 (85.7)

<sup>a</sup>Values are expressed as No. (%).

countries, and 30.1 million in Western Pacific involving 37 countries (10).

In the different parts of the world, reports of the prevalence rate of trichomoniasis are varied. This can be due to the different epidemiological factors such as socio-economic and cultural conditions. In the United States, the prevalence of trichomoniasis was reported variously such as 25% in population attending STI clinics and 38% in African-American women (2). In Africa, some major prevalence of *T. vaginalis* infection can be found in certain areas

for instance 65% in rural pregnant women and 38% among HIV-positive women in South Africa and Zaire, respectively (2). In Muslim countries, a lower prevalence of the infection has been frequently observed, ranging from 1.2% to 28.1% in Libya and Saudi Arabia, respectively (16, 17).

In Iran, as in other regions, the frequency of trichomoniasis has been reported differently although it is often lower than the rates reported in most of the other parts of the world. Recent studies in various areas of the country have revealed different prevalence rates of the infection

from as low as 0.9% to as high as 10.2% in women attending a Gynaecology Clinic in Amol and women prisoners in Tehran province, respectively (18, 19). Other recent reports are presenting the prevalence of trichomoniasis in Iran as follows: 1.4% (in Robat Karim), 2.1% (in Kermanshah), 2% (in Kashan), 3.2% (in Tehran), 3.3% (in Zanjan), 4% (in Babol), and 9.2% (in Tabriz) (20-26).

There is little information about the prevalence rate of trichomoniasis in pregnant women throughout the world, perhaps due to caution in vaginal sampling during pregnancy. One of the few studies on pregnant women was conducted in Zanjan. In that study, 1000 vaginal samples were surveyed for trichomoniasis by using direct wet mount and Dorset culture medium. Finally, 3.3% of the samples were positive for *T. vaginalis* and there was no correlation between trichomoniasis and education and also occupation status (24).

In the present study, the prevalence of trichomoniasis in pregnant women was 0.6% by using urine sediments for wet mount examination and culture method. This rate is lower than those derived from previous studies conducted on non-pregnant women in Hamadan reporting the prevalence rate of 2.2% in 2007 (27), 2.1% in 2010 (14), and 1.9% (in 2015) (in press). One of the reasons for the low prevalence rate may be due to lower sensitivity of urine sample compared to vaginal sample for detection of trichomoniasis (13). In this study, there were no statistically significant correlations between trichomoniasis and age, education, occupation, place of living, husbands' job, and history of contraceptive methods. However, none of the participants using condom as contraception method before pregnancy were infected with *T. vaginalis*.

In conclusion the present study showed that the rate of *T. vaginalis* infection in pregnant women is relatively low in this area. However, because of the importance of the infection as well as prevention of adverse outcomes in pregnant women, routine screening for *T. vaginalis* infection must be considered during implementation of antenatal care programs.

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### Footnotes

**Authors' Contribution:** Zarifeh Akbari contributed to sample and data collection and experiments; Mohammad Matini contributed to all stages.

**Conflicts of Interest:** The authors have no conflicts of interest to declare.

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