

The Prevalence of Trichomoniasis in High-Risk Behavior Women Attending the Clinics of Tehran Province Penitentiaries

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Abstract

Background: Trichomoniasis is a worldwide sexually transmitted disease (STD), and is associated with important public health problems, including enhancement of HIV transmission. The prevalence of the parasite, *Trichomonas vaginalis*, depends on host factors such as age, sexual activity, number of sexual partners and sexual behavior. The aim of the study was to evaluate the prevalence of trichomoniasis in high-risk behavior women, such as drug addicts and those who had multiple sexual partners, attending Gynecology Clinics in penitentiaries of Tehran province to help gynecologists with the diagnosis and treatment of the disease.

Methods: Samples of posterior vaginal fornix discharges and urines of 450 women attending Gynecology Clinics of three prisons in Tehran province were collected. All samples were examined by direct smear and cultured in TYI-S-33 culture media.

Results: 10.2% of subjects were positive for trichomoniasis. 82.7% of infected patients were symptomatic individuals who complained of vaginal discharge and itching and/or burning sensation. Most of the infected women in the high risk behavior group were drug users (54.3%). Physical examination showed that 50% of *T. vaginalis* positive subjects had a normal appearance of vagina and cervix. The peak prevalence (32.8%) of the disease occurred in the age range of 31-40 years.

Conclusion: *T. vaginalis* infection is commonly associated with other STDs, and is a marker of high-risk sexual behavior. Due to the side effects of the drugs used to treat the infection, it is suggested that the treatment be performed after definite diagnosis using a diagnostic method with a higher sensitivity.

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Keywords • Trichomoniasis • prisoners • sexually transmitted diseases • diagnosis

Introduction

Trichomoniasis is a common sexually transmitted disease (STD) that affects both women and men, although symptoms are more common in women. Infected individuals with *Trichomonas vaginalis* manifest a wide range of symptoms including giving birth to low birth weight infants, preterm labor, predisposition to cervical cancer, atypical pelvic inflammatory disease, infertility, and premature rupture of the membrane in pregnant women.¹

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The importance of the infection is in the association between *T. vaginalis* and an increased risk of transmission and acquisition of other sexually transmitted diseases including human immunodeficiency virus (HIV). The genital inflammation caused by trichomoniasis can increase a woman's susceptibility to HIV infection, if she is exposed to the virus. Trichomoniasis may increase the chance that an HIV-infected woman passes the virus to her sex partner(s).² Multisexual partners' women are an important group for transmission of most STDs all over the world.³

Most of the studies on *T. vaginalis* are based on microscopic examination and culture in different culture media. Although not an economical way for epidemiological study, culture media is the gold standard method. In females, *T. vaginalis* primarily inhabits the vagina but may also invade the urethra. In women, it is associated with a classically green frothy liquid discharge with a stink. Dysuria and dyspareunia are also common.⁴

The latest study on trichomoniasis in prisons of Tehran province was done in 2003.⁵ Six years later, the present study was undertaken to evaluate the prevalence of trichomoniasis in high risk behavior women including drug users and those with multisex partners' serving time in three penitentiaries (Evin, Rajae Shahr and Varamin) of Tehran province. The study was also aimed at examining possible associations between *T. vaginalis* infection and high risk behaviors.

Materials and Methods

The study was approved by Ethics Committees of Pasteur institute of Iran and Tehran Prisons Organization, Research Council of Tehran, and oral consents were obtained from all participants.

Four hundred fifty women referring to Gynecology Clinics of three prisons (Evin, Rajae Shahr and Varamin) in Tehran province in 2009 were surveyed. All patients were interviewed using a questionnaire, which contained questions regarding the demographic characteristics including name, age, occupation, and level of education, reason for imprisonment, contraceptive method used, and marital status. The participants were examined and their clinical signs and symptoms were recorded. Afterwards, samples of vaginal discharges were collected, and used for the isolation of *T. vaginalis*. Two sterile cotton swabs were used for the collection of vaginal discharge from posterior vaginal fornix of each patient. One swab was cultured immediately in Diamond's TYIS-33 medium, and incubated at 37°C. The other

swab was used for direct smear examination. Urine samples were also collected using sterile tubes, and were centrifuged at 1500×g for 10 min. The pellet was examined for any motile protozoa, and one drop of it was added to the culture medium. The cultured samples were examined daily for 7 days under inverted microscope to examine the growth of *T. vaginalis* as had been described earlier.⁶

Patients complaining of vaginal discharge and/or pruritis, dysuria, and dyspareunia were considered as symptomatic patients (SP). Isolates obtained from patients with no complain of such symptoms were considered as asymptomatic patients isolates (AP).

Calculations and Statistical Analysis

The sensitivity of the diagnostic method was calculated using the following formula:

$$\% \text{ Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}} \times 100$$

True positive values were based on positive cultures. Data were analyzed using Chi-Square and Student t-tests, and Epi-info statistical software. A P value of ≤ 0.05 was considered statistically significant.

Results

Of 450 individuals examined, 358 were from high risk behavior group consisting of drug users and those who had multiple sex partners. A total of 46 samples were diagnosed as positive for *T. vaginalis*, of which 25 (54.3%) were from high risk behavior group. There was a significant ($P \leq 0.05$) difference between the prevalences of the disease in women from high risk group and those in non high risk (murderers, thieves, etc.) group (table 1). Figure 1 shows *Trichomonas vaginalis* in smear prepared from vaginal discharge stained with Giemsa. The prevalence of the disease for the age ranges under 20, 21-30, 31-40, 41-50 and above 50 years were 8.6 %, 29.4%, 32.8%, 22.7% and 6.5%, respectively. Most of the infected women had been jailed for less than one month; i.e. nine samples (19.6%), and 43.5% of the infected women had a history of abortion. The sensitivity of vaginal culture for the diagnosis of

Table1: The Prevalence of trichomoniasis in samples obtained from prisoners jailed in Evin, Rajae Shahr and Varamine detention centers.

Prison	No. examined	No. infected	% of infected
Evin	187	23	12.3
Rajae Shahr	190	18	9.5
Varamin	73	6	8.2
Total	450	46	10.2

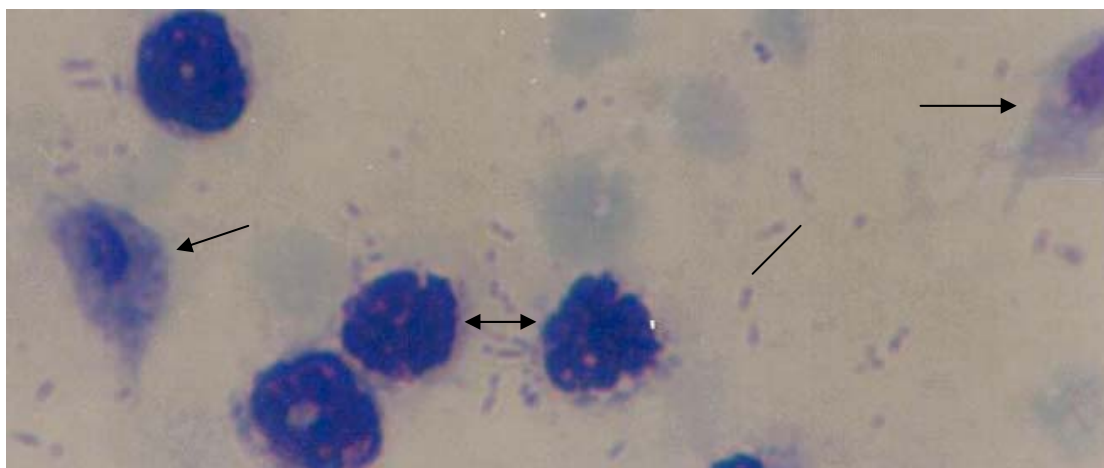


Figure 1: A prototype of Giemsa-stained vaginal discharge from an infected women, showing *T.vaginalis* (→), polymorphonuclears (↔) and microflora (—).

trichomoniasis was 98% (table2). The least infectivity was among those who used IUD as contraceptive. The percentages of infected women using condom alone or oral contraception were 15.2% and 17.4%, respectively. 21.7% of the infected women were divorced, 15.2% were widows, and the rest had husband. 15.2% of the husbands were driver, 21% were jobless and 67% had nongovernmental job. Common reported symptoms of the women participating in the study are shown in table 3.

Table 2: The number of *T. vaginalis* positive women based on the diagnostic method and the sensitivity of the diagnostic methods

Diagnostic method	No. of positives	sensitivity
Vaginal direct	41	92%
Vaginal culture	46	98%
Urine direct	14	60%
Urine culture	34	80%

Discussion

The present study was designed considering the importance of trichomoniasis as a worldwide sexually transmitted infection and its association with AIDS. The infection presents in a broad spectrum of clinical patterns in men and women, however, the disease also occurs asymptotically, which makes the screening for the disease important. Diagnosis is usually made based on wet mount microscopy and direct visualization, which are insensitive methods. Most gynecologists start treatment according to the clinical manifestations such as

vaginal discharge, burning sensation and dysuria. However, such criteria are not appropriate, since the symptoms of the disease are variable and full screening for detection of parasite is required.⁷

Reports on the prevalence of trichomoniasis in high risk behavior group in Iran are rare. The latest study in Evin house of detention reported 26% positivity for trichomoniasis in women referring to Gynecology Clinic in 2003.³ However, the present findings indicate that the prevalence of *T. vaginalis* has declined to 12.3%. This decline might be due to increased level of health services, teaching prevention guidelines for sexual infections using photographs and videotapes and improved levels of education among prisoners in recent years.

Factors such as low socioeconomic levels, poor education, increase of promiscuity, family instability may affect sexual behavior adversely and thereby the risk of STD in the community. Sexually transmitted diseases are very serious problems for public health, and affect women and their children more than men. Infected women suffer more from complications such as infertility, cervical cancer and complications for the fetus and newborn.⁸

As it was mentioned in the result section, the duration of imprisonment of 19.6% of infected women was less than one month. This might suggest that most of those who had

Table 3: Common symptoms reported by women participating in the study

Symptoms	Discharge	Discharge & itching	Discharge itching& burning	Itching& dysuria	others	Healthy	Total
No. of patients	136	37	64	11	58	144	450
No. of positive	12	7	11	0	22	14	46

genital problems had used free medical facilities in prisons. Wet smear and culture are routine diagnostic methods for *T. vaginalis* with varying sensitivity in different studies. Currently, the present gold standard method for the diagnosis of *T. vaginalis* is culture.⁹ This study showed a sensitivity of 98% for detecting the parasite by culture method, which is comparable with other studies.¹⁰ However, Sharbatdaran et al,¹¹ mentioned a higher sensitivity in wet smear compared to the culture. Also, a study by Hazrati Tapeh,¹² reported that wet smear was more sensitive than culture. The results of mentioned reports are not similar to those of the present study; however similar results have also been reported.¹³

The test of cure for trichomoniasis is necessary because asymptomatic patients are good carriers of the infection. Due to temporary imprisonment prior to proving an inmate guilt or transfer to other prisons, the follow up of the treatment was only possible for some of the participants. The samples recollected from 22 of those women, who had been treated with metronidazole (n=28), were negative for *T. vaginalis* a month later. Four of the six treatment failures were successfully treated with further courses of metronidazole. Only two women were still complaining of vaginal discharge, itching and/or burning sensation, and their collected samples were positive for *T. vaginalis* after several treatments.

The prevalence of trichomoniasis, diagnosed by clinical parameters, was reported to be 14.2% among women referring to Gynecology Clinics of Zahedan University of Medical Sciences,¹⁴ however the prevalence reduced to 8.5% when culture media was used to diagnose the infection. Such a disparity suggests that clinical diagnosis by a gynecologist has a low level of specificity, which results in wrong prescription and subsequent drugs' side effects and resistance. In a study by Garcia et al,¹⁵ in Lisbon, a prevalence of 31.2% for *T. vaginalis* was found among female inmates, of which only 65.1% had the symptoms of the infection. About 70% of infected patients in the present study were symptomatic. Since, 10-50% of women and 15-50% of men,¹⁶ are asymptomatic at diagnosis, a large proportion of patients might be excluded from the follow ups. A study on legal prostitutes in Ankara, Turkey found that 28% (64 out of 225) of women with vaginal wet smears were positive for *T. vaginalis*.¹⁷

The incidence of trichomoniasis is the highest in women with multiple sex partners and in those with a high prevalence of other STDs.¹⁸ Garcia et al,¹⁵ also studied the association

between the existences of *T. vaginalis* infection and the presence of multiple sex partners, drug addiction or use of no condom. They reported that there was no a statistically significant correlation between the existences of *T. vaginalis* and the presence of multiple sex partners, drug addiction or no condom use. The use of condoms may not be very important in the prevalence of trichomoniasis as indicated by findings of the present study as well, but the other two factors have a significant effect on the distribution of STDs.

Conclusion

Trichomoniasis is prevalent among high risk behavior women. It can also help facilitate the transmission of other infectious diseases like AIDS. Therefore, a definite diagnosis is of paramount importance in the prevention and treatment of the infection. Moreover, definite and correct diagnosis help reduce the cost and adverse effects of the treatment. The treatment of partners also helps the prevention and treatment of the infection.

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Conflict of Interest: None declared

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