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Short Communication

Prevalence of Trichomoniasis among 18-48 Year-old Women in Northwest of Iran

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Received 05 Dec 2015 Accepted 15 Jul 2016	Abstract Background: The aims of this study were to examine the prevalence of trichomoniasis among women aged 18 to 48 yr in Ardabil, northwestern Iran and the relationship between demographic factors and the risk of infection. Methods: Vaginal discharge samples of 914 women aged 18 to 48 yr, referred to Gynecology Clinic of Sabalan Hospital of Ardabil, Iran in 2014, were collected and <i>Trichomonas vaginalis</i> infection was examined using wet mount and Dorset culture medium. In addition, demographic data was collected using a questionnaire as well as clinical examination, and analyzed with SPSS ver. 16, using Chi-square test, and <i>t</i> -test. Results: Of the 914 samples studied, 3.38% by wet mount and 4.48% by parasite culture were infected by <i>T. vaginalis</i> . Sensitivity of direct or wet mount method was 75.6% compared to culture method (standard). We found a significant statistical relationship between trichomoniasis infection and preterm birth ($P=0.011$). Conclusion: The prevalence of trichomoniasis in Ardabil compared to global statistics (5%-74%) is low. Interestingly, the results of this study (4.84%) were consistent with the results obtained in Tabriz (4.46%).
Keywords: Trichomoniasis, <i>Trichomonas vaginalis</i> , Prevalence, Women, Iran	
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Introduction

Trichomoniasis is an important parasitic disease that is prevalent all over the world. This infection is often transmitted through sexual intercourse and because of

this, it is considered as one of the sexually transmitted diseases (STD). The cause of this infection is a flagellated protozoan named *Trichomonas vaginalis*. Trichomoniasis infection in

women results in vaginitis, cervicitis and urethritis, and may lead to necrosis and hemorrhage in vaginal epithelium and cervix of the uterus, and cause the risk of cervix carcinoma. This infection leads to some outcomes in pregnant women, such as preterm birth and delivery of low birth weight infant, and facilitates the transmission of HIV. According to numerous studies in the world, the prevalence of trichomoniasis infection is changeable and it is estimated to be 5%-74% in women and 5 to 29% in men (1). In Turkey, the prevalence of the disease in women aged 18-45 yr was determined to be 9% using wet mount and Giemsa staining (2). In Portugal, the prevalence of trichomoniasis among 211 women was determined to be 31.2% based on vaginal discharge samples using wet mount and parasite culture (3).

In Iran, the prevalence of trichomoniasis in different age groups was determined as between 0.5%-30% (4). In a cross-sectional study on 750 women in Hamadan using clinical examination, wet mount and parasite culture in Dorset medium, the prevalence of this infection was determined to be 2.1% (5). In Zahedan, a study of 597 samples of vaginal secretions was conducted directly using wet mount, Dorset culture medium and Diamond culture medium. *T. vaginalis* infection was determined to be 5.7% and the sensitivity of Dorset culture medium was determined to be 83.3% compared to Diamond culture medium; and McNemar's test indicated no difference between sensitivity of Dorset culture medium and Diamond culture medium. Based on the results of the study, the sensitivity of Dorset culture medium is significant and valuable (6).

This study aimed to determine the prevalence of *T. vaginalis* among 18-48 yr-old women visited the gynecology clinic of Sabalan hospital in Ardabil, north-west of Iran.

Materials and Methods

The study was conducted using cross-sectional method over a period of 12 months

from 2014 until 2015. Sampling and clinical examination of women were performed in the gynecology clinic of Sabalan hospital (Ardabil, north-west of Iran). First, demographic data was collected by employing a questionnaire. Then the clinical examination was done to examine trichomoniasis symptoms, and the samples of vaginal secretions were collected. Vaginal samples were used in the research laboratory at the Faculty of Medical Sciences, Islamic Azad University in Ardabil, for wet mount, staining and Dorset culture.

Based on the time schedule of the survey during eight months (Apr-Nov 2014), our colleagues in Gynecology Clinic of Sabalan Hospital selected the samples randomly regardless of the disease or the reason of referring to the clinic. Then, physical examination was done and clinical symptoms were identified. The samples of vaginal secretions were prepared using sterile swab and the questionnaire was completed. Demographic data including age, gender, location, education level of both spouses, and health status and economic situation of the family was recorded.

Samples prepared from vaginal secretions were quickly transferred in less than one hour to the research laboratory of Faculty of Medical Sciences in sterile conditions using glass vial containing 1 cc glucose-enriched ringer's solution (5% sugar solution). In the lab, the project manager and the executive partners prepared the wet mount on one hand and cultured the samples using Dorset method on the other hand.

The medium chosen for cultivating vaginal samples was a diphasic Dorset one. The medium was prepared according to the instructions of this method (7). Then, the prepared cultures were transferred to a 37 °C incubator and were kept there for one week. Once every 24 h, a sample was taken from the medium and after preparing wet mount and staining, microscopic search of *T. vaginalis* trophozoites was performed.

To analyze the data, SPSS ver. 16 (Chicago, IL, USA) was used and the statistical tests of Chi-square and t-student were applied.

Results

Of 914 samples of vaginal secretions in women aged 18 to 48 yr in this study, 31 cases were diagnosed positive in terms of *T. vaginalis* based on wet mount method (3.38%). The number of infected and positive cases was 41 based on Dorset parasite culture (4.48%) (Table 1). Sensitivity of direct or wet mount method was 75.6% compared to culture method (standard). The mean age of women with trichomoniasis was 32.8 and the highest prevalence was observed between the ages 30 to 40 (60.9%).

Since the amount of *P*-value was calculated to be 0.140, no significant relationship was found between the age and trichomoniasis infection. 82.9% of patients were housewives, 12.2% were employees and 4.9% were university students. Therefore, most of the patients with trichomoniasis were housewives.

The women studied were classified into four groups in terms of level of education: illiterate, junior high school diploma holder, senior high

school diploma holder, and BA holder. 22% of people were illiterate, 46.6% had a junior high school diploma, 24.4% had a senior high school diploma and 7.3% had BA. Therefore, most patients (68.3%) belonged to two groups of illiterates and junior high school diploma holders.

The most important clinical symptoms in women with trichomoniasis were burning, itching and abnormal smelly discharges. Some people have only one of these symptoms. For example, 2.4% of people only suffered from burning. However, in 48.8% of cases, all three symptoms, i.e., burning, itching and abnormal smelly discharges were observed.

In addition, of 41 cases with trichomoniasis, two cases (4.9%) had a history of preterm labor. Of the 873 women without trichomoniasis, 28(3.2%) cases had a history of preterm labor in this research and the *P*-value obtained was 0.011, which was less than 0.05%, thus there was a significant statistical relationship between preterm birth and trichomoniasis infection (Table 2).

Table 1: Identification of infection with *Trichomonas vaginalis* in vaginal secretions using wet mount and parasites culture

Method	Negative cases n (%)	Positive cases n (%)	Total
Wet mount	883 (96.62)	31 (3.38)	914
Cultivation	873 (95.52)	41 (4.48)	914

Table 2: Preterm labor in two groups of women with and without trichomoniasis

Preterm labor	Women without trichomoniasis n (%)	Women with trichomoniasis n (%)	<i>P</i> -value
No	845 (96.8)	39 (95.1)	0.011
Yes	28 (3.2)	2 (4.9)	
Total	873 (100)	41 (100)	

Discussion

Based on the results of the research, of 914 women aged 18 to 48, 31 women (3.38 %) by

wet mount and 41 women (4.48%) by parasites culture in Dorset medium were diagnosed with trichomoniasis infection. Sensitivity of direct method was 75.6% compared to

culture method (standard). No significant relationships were found among age, level of education, economic situation of the household and clinical symptoms in women with trichomoniasis infection. 9.8% of people with trichomoniasis had a history of abortion.

However, since 7.65% of women without trichomoniasis had a history of abortion and the *P*-value was calculated to be 0.209, no significant relationship was found between the history of abortion and trichomoniasis infection. Although, 4.9% of patients with trichomoniasis had a history of preterm labor, significant relationship was found between premature labor and trichomoniasis because 3.06% of women without trichomoniasis also had a history of premature labor and the *P*-value was calculated to be 0.011% ($P < 0.05\%$).

The prevalence of trichomoniasis infection in the world is between 5%-74% (1). Thus, the prevalence of trichomoniasis in Ardabil (4.48%) is less than the global rate. The prevalence of trichomoniasis in women in New South Wales of Australia was determined to be 8.4% (8). In Ethiopia, the prevalence of this infection among pregnant women was reported to be 6.3% (9).

In Turkey, a study was conducted on women aged 18-45 and the rate of infection was determined to be 9% (2). In India, trichomoniasis infection was investigated among women aged 20-40 and the rate of infection was determined to be 12.06% (10). In Zambia, the infection was estimated to be 24.6% in adolescent girls and 32.2% in pregnant women (11). In Portugal, the prevalence of trichomoniasis was determined to be 31.2% using wet mount and parasite culture (3). Compared with the results of these studies, the prevalence of trichomoniasis in Ardabil (4.48%) is lower than different countries (5%-74%). For example, the prevalence of trichomoniasis in Portugal (31.2%) is about 7 times higher than that of Ardabil.

In Iran, the prevalence of trichomoniasis in different age groups is between 0.5%-30% (4). The prevalence of trichomoniasis in Tehran

(12), Hamadan (5), Robat Karim (13) and Kashan (14) was measured to be 2.9%, 2.1%, 1.4% and 1.3%, respectively. The prevalence of trichomoniasis in Ardabil (4.48%) is clearly and significantly higher than that of the mentioned cities. In other cities of Iran, including Khorramabad (7), Chabahar (15) and Zahedan (6), the prevalence of trichomoniasis was reported to be 18.75%, 9.57% and 5.7%, respectively; and the prevalence of this infection in Ardabil is much lower compared to these cities.

In Tabriz, trichomoniasis infection among 2630 women was determined to be 3.46 % by wet mount method and 4.56% by culture method (4). The prevalence of the disease among the 914 women studied in Ardabil is 3.38% by wet mount method and 4.48% by parasite culture method. Therefore, the prevalence of trichomoniasis in Tabriz and Ardabil is largely similar. Tabriz and Ardabil are the capitals of their provinces, and these two neighbors are located in the north-west of Iran and they are very similar in terms of climate, culture and social and health issues.

Conclusion

The prevalence of trichomoniasis in Ardabil compared to the global statistics (5%-74%) was low.

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