

The Prevalence of *Trichomonas vaginalis* among married women in Misurata

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Abstract

This study was conducted on 125 married women aged between 15 and 53 years. The study took place from October 2015 to April 2016. The vaginal examination was conducted using a sterile colposcope in order to take a vaginal swab from each patient for a Wet Mount Test and another one for the Laboquick *Trichomonas vaginalis* Ag Test. A third swab was taken from some patients for the bacterial test.

The aim of this study was to determine the prevalence of *Trichomonas vaginalis* among married women in Misurata and to compare two diagnostic techniques for the detection of this parasite. In addition, it aims to study the effect of some factors that affect the spread of these parasites.

The results of the study showed that the number of women with *Trichomonas vaginalis* was 4 patients out of the 125 (3.2%) . the highest rate of infection was 3.2% depending on the Laboquick *Trichomonas vaginitis* Ag Test, while the rate of injury was 0.8% by the use of the other test.

Patients were divided into different age groups. The highest percentage was recorded by the age group (27-38), reaching 4.1%. The rate of *Trichomonas vaginalis* infection was higher among women with low education by 4.2% when compared to other well-educated women . The symptoms of vaginal discharge, itching, low abdominal pain, and bad odour showed the highest percentage of occurrence, reaching 50%. Moreover, women who experienced recurrent symptoms had a higher percentage of infection than women who experienced symptoms for the first time at 3.4%.

conclusion: This study indicated that there was a limited prevalence of *Trichomonas vaginalis* among the participants. The fact that the Laboquick *Tichomonas vaginalis* Ag Test can be done simply and quickly needless of any technical experience and it can be of low cost. Consequently, it may be used in the routine check to improve the diagnosis of *Trichomonas vaginalis*.

Keywords: *Trichomonas vaginalis* , Wet Mount Test , Laboquick *Trichomonas vaginalis* Ag Test

Introduction:

Sexually Transmitted Diseases (STDs) are highly pathogenic non-viral, curable STD which usually attacks the genitor-urinary system [3]. *T. vaginalis* is very common worldwide and the sexual intercourse is the primary cause for its transmission. WHO statistics indicate that millions of people are bacterial urinary-tract infections [7]. Thus, laboratory diagnostic methods are important for accurate detection of the infection, and therefore, appropriate treatment can be applied [18].

Due to the complications caused by the parasite and the limited research on the prevalence of *T. vaginalis* in Libya, this study aimed to know the prevalence of parasite among married women in Misurata and based on a diagnosis of the clinical symptoms only. It also aimed to examine some factors that may help spread the disease and diseases that are caught as a result of having sex with an infected person and they can be caused by pathogens such as bacteria, fungi, viruses, and parasites. They are incredibly common as millions of new infections occur in the world remaining undiagnosed (WHO, 2008). Among these sexually

annually affected by this disease (WHO, 1995; Schwebke & Burgess, 2004).

Clinical symptoms are not specific to *T. vaginalis* and can be confused with other sexually transmitted infections, yeast infections, or

comparing routine screening with the Laboquick *Trichomonas vaginitis* Ag Test and ultimately recommending the use of the best method.

Materials and methods:

The study was conducted at some hospitals in Misurata from December 2015 to April 2016. The study population included 125 women experiencing the symptoms of *T. vaginalis*, aged 15-53 years. Before collecting and examining the

transmitted diseases are parasitic infections that gradually catch attention because of their significant impact on human health (Malla & Goyal, 2012). Trichomoniasis is one of the diseases caused by anaerobic parasites called *Trichomonas vaginalis* which is classified as a

samples, specific information was taken from the patients suspected of having Trichomonas vaginitis and it was later collected in a special form designed for this purpose .

Two vaginal swabs were collected from each patient. The samples were taken from the cervix uteri and the side walls of the vagina using vaginal telescope, by a doctor. One of the swabs was placed directly in a special tube containing 1 ml of physiological saline solution, prepared by Laboquick Company, to be examined using the Laboquick T. vaginalis Ag Test. The second swab was done by the direct examination method.

Samples examination

1 -Laboquick T. vaginalis Ag Test (Product by Laboquick company , Bomve – Izmir - Turkiye) Laboquick T. vaginalis Ag Test can detect T. vaginalis antigens within vaginal swab samples. This testing swab is equipped with one field to place the sample and another one to show the result of the examination. The latter contains two lines. One of those lines marked as ‘C’ is to verify the validity of the test and the other one ‘T’ is to show the result of the sample test (the subject of study).

If the sample contains a T. vaginalis antigen, the line T will be coloured indicating that the result is positive. In contrast, if the sample does not carry the T. vaginalis antigen, or if the amount of antigen is low that line will not appear revealing a negative result. This test was conducted in the laboratories of Oncology Hospital, Specialized Center for the Regulation and Treatment of Diabetes and Endocrinology, and Shifa Hospital.

2 -Wet Mount Examination

The vaginal swab is stained on a clean glass slide Within 5 minutes of the collection process in order to be examined under an X 10 / X 40 light microscope after placing the slide cover (Thomason & Gelbart 1989) . On one hand, the examination has been considered positive when the parasite existed observing its shape and motion. On the other hand, the examination was considered negative when the parasite was not seen for 3-5

minutes following the continuous examination of the glass slide

3 -Bacterial Test

A third vaginal swab was obtained from some samples (30 samples) in order to examine the types of bacteria found in those samples. The samples were cultured on MacConkey’s agar, Blood agar and agar chocolate. Whereas MacConkey’s Agar and Blood agar were involved in air incubation at 37 ° C, chocolate agar was incubated anaerobically using the Gas-Pak system, after writing down the swab number and date of receipt, and then examining it after 24 hours.

Statistical analysis:

The results of this study were analysed using Minitab-16 program in order to analyze the data statistically. The findings were considered whenever (p-value $0.05 \geq$) using the Chi- square test, the two proportion test, and the Fisher’s test. To determine degree of correlation, the Pearson Correlation Test was used based on generally accepted scientific and statistical principles and principles.

. Result

The results of this study indicated that the number of infected married women showing symptoms of the disease was 4 positive samples out of 125 samples, i.e. 3.2% (95% CI 0.88% to 8). The results of the statistical analysis showed that this value does not represent any statistical significance (P- value = 0.122) which confirms that the prevalence of this disease is not significant among the study population .

1 -Methods for the diagnosis of Trichomonas vaginalis

All vaginal secretion samples collected from the infected married women underwent a direct wet mount examination and a Laboquick examination. It was revealed that the number of infected women using the former examination was 1 positive infection i.e. (0.8%) while the use of the latter shown that there were 4 positive infections i.e. (3.2%). Table (1) below illustrates the results of both laboratory methods.

Method	Number of negative samples	Number of positive samples	Total
Wet Mount Test	124 (99.2%)	1 (0.8%)	125
Laboquick Test	121(96.8%)	4 (3.2%)	125

Table 1: The results of the diagnosing tests of *T. vaginalis*.

2 -Examining Some of the Factors Which Can Cause the Spread of T. vaginalis :

The age of the participants varied ranging from 15 to 53 years old. They were divided into three age groups as shown in the table (2). The highest percentage of infections was among the second group i.e. (4.1%).

However, the results showed that the differences among the three groups regarding the percentages of infections were not statistically significant.

Table 2: The Spread of *T. vaginalis* among Women Based on Age Groups and using the Laboquick Test.

Age Groups	Year	Number of Samples %	Number of Positive samples %	P- value
First	26 – 15	37 (29.6 %)	1 (2.7%)	1.000
Second	38 – 27	48 (38.4 %)	2 (4.1 %)	
Third	- 39<	40 (32 %)	1 (2.5 %)	
Total		125 (100%)	4	

Table (3) illustrates how participants were classified into three categories according to their education level. The study revealed that the highest percentage of infection was among subjects of the first education level i.e. (4.2%). The findings of the statistical analysis have shown that the relation of the education levels of subjects to the infected women was not significant.

Table 3: The connection between the infection of *T. vaginalis* and the education level of patients

Education Levels		Number of Samples %	Number of Positive samples %	P- value
First	Primary School	47 (37.6 %)	2 (4.2%)	0.375
Second	High School	30 (24 %)	1 (3.3 %)	
Third	graduate/post-graduate studies	48 (38.4 %)	1 (2.1 %)	
Total		125 (100%)	4	

Each patient was suffering from a group of symptoms at the same time. Based on this research, the highest percentage i.e. (50%) of infected women suffered from vaginal discharge, itching, lower abdominal pain, and bad odour with the p-value (0.000) as illustrated in table (4).

Table 4: Accompanying Clinical Symptoms of 4 Infected Women with *T. vaginalis*

Accompanying Clinical Symptoms	Number of Positive samples %	P- value
vaginal discharge, itching, lower abdominal pain, and bad odour	2 (50%)	0.000
vaginal discharge, itching, lower abdominal pain, bad odour and dyspareunia	1 (25%)	
vaginal discharge, itching, and dyspareunia	1 (25%)	
vaginal discharge, bad odour and dysuria	0 (0%)	
Total	4 (100%)	

The description of the treatment without diagnosis or being unaware of the microbial causing the symptoms of the infection may lead to recurrence of symptoms again. As shown in table (5) patients suffering from a recurrence of symptoms reached the highest rate of infection and by (3.4%) compared to those who experienced the symptoms for the first time i.e. (2.7%). The results of the statistical analysis showed that there were no statistically significant differences between the rates of infection among the two categories.

Table (5): Recurrence of symptoms of *T. vaginalis*

Symptom Indications	Number of samples %	P- value	Number of Positive samples %	P- value
First Symptom presence	37 (29.6%)	0.000	1 (2.7%)	0.835
recurrence of symptoms	88 (70.4%)		3 (3.4 %)	
Total	125		4	

3. Bacterial Test:

The pathogenic bacteria in the vaginal discharge through the transplantation process were as shown in the table (6). Although there were no statistically significant differences between bacterial species, the number of the bacterially infected cases exceeded the number of those with fungal infections. The study revealed that 29 out of 30 samples were infected with bacteria i.e. (96.66%). In contrast, 1 out of 30 samples was infected with *Candida* spp. i.e. (3.34%), in statistical terms, (p-value = 0.00).

Table 6: Bacterial and fungal species in vaginal secretions of women showing symptoms of *T. vaginalis*

of Bacteria	Number of cases
<i>lla spp</i>	6 (20%)
<i>ureus</i>	6 (20 %)
<i>monas</i>	7 (23.3%)
	10 (33.3 %)
<i>a spp</i>	6 (20 %)

Discussion:

This study revealed 4 positive samples out of 125 married women who had symptoms of *T. vaginalis* i.e. 3.2%. This indicates that the actual prevalence of this parasite was very low. This is due to the fact that the *T. vaginalis* parasite is not a health problem of an epidemiological threat among married women in Misurata. The low prevalence in this study may be due to the frequent description by doctors of Metrandiazole as an anti-vaginal infection in general in addition to raising awareness programs of sexually transmitted diseases. A number of studies have been conducted on this parasite, its spread and its various worldwide effects. However, such studies were limited in Libya, including a study conducted in Benghazi by (Kassem & Majoud 2006) with an infection rate of 1.2%, while another study in Al-Zawia (Sadek & Gammo, 2012) has revealed that the infection percentage was 36.7%.

The result of this study was identical to a study conducted in Tehran by Rezaeian (2009), i.e. 3.2%. On one hand, the rate of infection was higher in this study than in a study conducted by (Karimi and Chalechale 2010) in Iran by a percentage of (0.9%), (Caiyan *et al.*, 2011) by 1% in Beijing (China). On the other hand, the prevalence of *T. vaginalis* was lower than that revealed in the current study, such as that in Sudan (Saleh *et al.*, 2014) 85%, and a study by Barbuceanu and Vacarel (2010) in CURTEA DE ARGES (Romania), with a prevalence rate of 46.29%. This widespread prevalence of *T. vaginalis* can be attributed to limited or nonexistent concern about this serious problem on public health (Amadi, & Nwagbo, 2013).

The highest incidence of *T. vagin alis* parasite was among the age group 27-38 years, i.e. 4.1%, followed by the age group (15-26) by 2.7%. The reason for the relatively high percentage of infections among these age groups since they represent the early years of marriage at which point the reproductive hormones reach their highest level which then decline with age (Abduluahab *et al.*, 2011).

Despite the slight differences in the age range, the results of this study were consistent with those of Karimi and Chalechale in Iran (2010), as the highest percentage was 33.0% in the age group (30-39) followed by the 20-29 age group. Contrastively, other studies such as (Dawood *et al.* , 2013) in Iraq, showed that the highest incidence was between 15 and 29. Another study of Sadek & Gammo (2012) in Al-Zawiya, Libya, the highest rate of infection was recorded among the age group (40 – 45). Despite the fact that the prevalence of *T. vaginalis* parasite among different age groups was relatively different, this study indicated that the connection between the prevalence of infection and the age group has no statistical significance.

The level of education has a significant impact on the incidence of *T. vaginalis*. The study showed that the highest rate of infection among women with primary education reached 4.2%. The results of the statistical analysis showed that the difference is not significant in terms of the relation of the level of education to *T. vaginalis*. Obviously, these results were close to most related studies on in which low educational level was associated with increased rate of *T. vaginalis* including the study of Sumadhya (2012) in Sri Lanka and another study in the United States (Annang, 2010). Perhaps the reason for the high incidence of infection among women with low education is due to their lack of healthy life style and regular inspection, and not seeking the necessary treatment.

The clinical symptoms associated with women with symptoms of the disease involved vaginal secretions, vaginal itching, low abdominal pain, bad odour, dyspareunia, and dysuria. This variation in the nature and severity of clinical symptoms depends on the severity of the infection. Based on this research, the highest rate was that of women who experienced symptoms like itching, low abdominal pain and a bad odour i.e. 50% (P-value = 0.000).

In comparison with previous studies, the percentages of the clinical symptoms were different. Mushref (2011) reported that the highest percentage, 46.7%, was that of women suffering from vaginal secretions and itching and 31.0% of women had white and greenish vaginal secretions. In a different study conducted by (Sadek and Gammo 2012), patients displayed symptoms such as vaginal itching 36.1%, dysuria 22.2%, then dyspareunia 14.3% and finally hemorrhagic points on the cervix uteri 2.8%. It can be seen throughout this study and other previous studies that *T. vaginalis* parasitic can be associated with any form of clinical symptoms.

This study showed that the infection with *T. vaginalis* parasites reached 3.2%, which is a small percentage if compared to the number of cases with the same symptoms. Therefore, this parasite is not the main cause of these symptoms, but there are other organisms that may produce the same symptoms of the disease. Throughout the implantation of vaginal secretions of some samples, the majority of cases proved to be caused by bacteria 96.66% while only one sample was caused by *Candida* spp 3.34%. Many studies including this study showed that vaginitis is essentially caused by bacterial infection, and nosomycosis and parasitic infection respectively.

The most serious concern is the recurrence of disease symptoms. 88 patients in this research suffered from a recurrence of symptoms i.e. 70.4%, presenting a significant difference when compared to the 37 patients experiencing the same symptoms for the first time i.e. 29.6% P-value = 0.00.

The frequent incidence of such infections during a woman's life may be caused by a microbial imbalance between living organisms that form normal flora. In addition, it can be attributed to other reasons such as taking antibiotics, taking contraceptive pills, inaccurate diagnosis and receiving treatment without undergoing a sensitivity test and other laboratory tests (Gutman et al., 2005).

The study was conducted to determine the feasibility of diagnosing the *T. vaginalis* among married women using the Laboquick T.v in comparison with the Wet Mount test. 3.2% out of the 125 samples taken in this study were positive using the former test whereas the positive results appeared to be 0.8% when using the latter. The difference between the results of the two tests was statistically significant. Furthermore, the sensitivity of the Laboquick *Trichomonas vaginalis* was 100% while the other test scored a sensitivity of 25%. Thus, the sensitivity of the Laboquick *Trichomonas vaginalis* was statistically superior to the Wet Mount Test (P-value = 0.00).

Several studies confirmed that the Immunological sensitivity is higher than that of the Wet Mount Test, such as (Madhivanan et al., 2013), (Aboulghar et al., 2009) and (Huppert et al., 2007) in which the sensitivities of the two tests were (86.1% & 83.3%), (87.5% & 56%) and (90.9% & 56%), respectively.

After discussing the findings of this study, it can be concluded that there is a low prevalence of *T. vaginalis* infection among the population of this study. This indicates that *T. vaginalis* does not pose a real risk to married women in Misurata. Therefore, *T. vaginalis* parasite is not responsible for the clinical symptoms which the participating married women suffered from. However, causing factors may include bacteria and fungus. The study also reveals that the Laboquick method is highly effective, and reliable for the diagnosis. Moreover, occurring clinical symptoms cannot be relied upon during the diagnosis process.

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