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Research Article

Prospective Study of *Trichomonas vaginalis* Infection

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Abstract: A total of 60 vaginal swab samples from women were collected and examined at Kut Hospital for Women and Children in Wasit province for the period of October 2013 to the end of January 2014. All women aged (14-53) years old were subjected to standard clinical examination and vaginal samples were collected for identification of *Trichomonas vaginalis* by wet mount preparation. Our results revealed high incidence (20%) of *T. vaginalis.* The present study has been noted that *Trichomonas vaginalis* infection occur at ages of greatest sexual activity (24-43) years old (6.7%).The T-test also showed statistical significant differences in the prevalence of the trichomoniasis of all age groups(T= -2.91, P= 0.044).The clinical symptoms were studied and appeared that 8.3 % of the women had a vaginal pH = 6.5 , 6.7 % have vaginal discharge, and 8.3% have vaginal itching and dysuria. We concluded our results that there is no safe and effective method of prevention of trichomoniasis in this area.
Keywords: *T. vaginalis*, Human, Wet mount

INTRODUCTION

Trichomoniasis is commonly known as a sexually transmitted disease (STD) of humans [1, 2]. *Trichomonas vaginalis* (*T. vaginalis*) is a extracellular single-cell, flagellated parasite that usually lives in the female lower reproductive tract and rarely the male urethra, classified as a sexually transmitted agent [3, 4]. Unique genetic and structural features place the parasite at the base of the eukaryotic phylogenetic tree and suggest an intriguing evolution toward mucosal parasitism. *T. vaginalis* was the etiological agent in some cases of vaginitis. That concept took many years to become universally accepted [5, 6]. *Trichomonas vaginalis* is a highly prevalent and under-diagnosed sexually transmitted infection that facilitates transmission of and susceptibility to HIV infection [7]. Although current treatment is effective the disease is still poorly controlled and there are concerns about increasing levels of drug resistance [8, 9].

The actual number of people infected with trichomoniasis may be much higher than this according to the Center for Disease Control and prevention [10], *T. vaginalis*, with prevalence rates of 15% or higher in developing countries particularly where access to health care is limited. Consequently, it is likely that up to 25 million pregnant women globally are infected with trichomoniasis by providing low pH (4-4.5) in the environment [1, 11]. *In vitro* study demonstrated that in presence of *L. acidophilus* more number of vaginal epithelial cells (VEC's) were found attached by *T. vaginalis* as compared to controls and significant reduction was observed in presence of excretory secretory products of *L. acidophilus* [12], thereby suggesting that adhesion of parasite to target cells is pH dependent.

The symptoms of trichomoniasis in women range from none at all to a severe acute inflammatory state. Classic signs and symptoms include a purulent, malodorous vaginal discharge with associated pruritus, burning, dysuria and dyspareunia. Physical examination in affected women shows vaginitis and vulvitis, with a frothy, yellow-green mucupurulent discharge. *Colpitis macularis* ("strawberry cervix") may be seen colposcopically [13-15]. Though physiological protection exists, some women are quite prone to develop vaginal infection dueto some pathologic flora invading or replacing the normal commensals with its deleterious effect leading to pregnancy and perinatal complications [16].

The infection is low in women in higher socio-economic groups and high (55%) in the developing countries and in minority groups of industrialized populations [17]. Based on family income, The researchers have observed that 90% infected women belonged to middle and lower socio-economic status, while only 10% were from upper socio-economic status, thereby indicating that socioeconomic factors seem to play role in this infection [18]. As well as low birth weight infants have been associated with *T. vaginalis* infection. Therefore, the magnitude of *T. vaginalis* infections and their associated morbidity

make accurate diagnosis important and cost effective [19]. The aim of our study was to identify outbreaks of *T. vaginalis* in Kut City, Iraq.

MATERIALS AND METHODS

Patients and samples

This study was conducted in the gynecology clinic at Kut Hospital for Women and Children in Wasit province for the period of October 2013to the end of January 2014. A total of 60 cases of infected of women were included in this study. These patients have complained of clinical diagnosis of *T. vaginalis* included yellowish-green frothy, itching, dysuria, dyspareunia, and "strawberry" cervix, which is characterized by lesions hemorrhagic dotted and clinically diagnosed by a physician. Some of the patients did not receive any chemotherapy to combat infections by screening diagnosis. , And others suffering from a return of the disease after the end of the treatment period patients were selected randomly and the duration of their illness were no more than 9 months and not less than two weeks.

Parasitological Examination

Wet mount

Diagnosis of *T. vaginalis* by microscopic examination considers most traditionally method. Wet mount preparations are useful for giving clear images of fresh specimens under the microscope .Wet mount microscopy is assumed to have perfect specificity. Diagnosis by wet mount requires visualization of viable, motile protozoa; therefore, specimens must be examined immediately. Vaginal secretions are obtained from the lateral walls and fornices using a swab. Microscopy can be further reduced as a result of delays between specimen collection and examination.

Whiff test

In this test the amine odor test was performed by mixing several drops of 10% potassium hydroxide (KOH) to a sample of vaginal discharge. A strong fishy odor is indicative of a positive test result. This test may be positive for either trichomoniasis or bacterial vaginosis.

Geimsa stain

A small amount of vaginalis fluid was taken and spread on a clean glass microscope slide then left it to dry completely, then fixed using 100% absolute methanol for 30 seconds and left to dry again. The fixed smear was stained with Geimsa stain for 20 minutes [20], then rinse in tap water and dry it, then examined under the 100X oil immersion lens to see *T. vaginalis.*

Measuring the pH

A pH of vagina was measured by using special dipstick papers and made it in contact with the vaginal fluid sample and compared the resulting color with standard color on the box.

Statistical Analysis

The suitable statistical method was used in order to analyze and assess the results by using T-test in Minitab version [21]. The comparison of significant (P-value) in any test were: S= Significant difference ($P<0.05$), HS= Highly Significant difference ($P<0.01$), and NS= Non Significant difference ($P>0.05$).

RESULTS

Table 1 represents percentage of positive cases of *T. vaginalis* (20%) by using two methods.

The distribution of *T. vaginalis* infection according to age groups are shown in table 2. The highest infection (6.7%) appeared in age group (14-43) years old.

The distribution of *T. vaginalis* infection according to the odor of vaginal discharges are shown in table 3.

Table 4 represents the distribution of pH value in positive cases of *T. vaginalis.* The highest infection (8.3%) appeared in pH = 6.5.

The yellowish frothy of vaginal discharge was the highest 10% in positive cases of *T. vaginalis* as shown in table 5.

The clinical symptoms of patients with *T. vaginalis* are shown in table 6.

Table 1: The incidence of *T. vaginalis* according to different identification methods

Methods	*T. vaginalis* +ve	Percentage
Wet mount	7/60	11.7
Whiff test	5/60	8.3
Total	12/60	20

Table 2: Distribution of *T. vaginalis* infection according to age groups

Age Group	Positive	(%)	Negative	(%)	Total
14-23	4	6.7	7	11.7	11
24-33	4	6.7	22	36.7	26
34-43	4	6.7	15	25.0	19
44-53	0	0.0	4	6.7	4
Total	12	20	48	80	60

T = - 2.91, P= 0.044

Table 3: The distribution of *T. vaginalis* infection according to the odor of vaginal discharge

Odor	Positive cases	(%)
Bad Odor	8	13.3
No Odor	4	6.7
Total	12	20

T = - 1.91, P = 0.128

Table 4: The distribution of *T. vaginalis* infection according to the pH degree

pH	Positive cases	(%)	Negative cases	(%)	Total
6	3	5	10	16.7	13
6.5	5	8.3	28	46.7	33
7	4	6.7	10	16.7	14
Total	12	20	48	80	60

T = - 2.40, P = 0.096

Table 5: The distribution of *T. vaginalis* infection according to the color of vaginal discharge

Color of discharge	Positive cases	(%)
Yellowish color	6	10
White color	4	6.7
colorless	2	3.3
Total	12	20

Table 6: The distribution of *T. vaginalis* infection according to clinical symptoms

Clinical Symptoms	Positive cases	(%)
Discharge only	4	6.7
Discharge and itching	2	3.3
Discharge and dysuria	1	1.7
Discharge, itching and dysuria	5	8.3
Total	12	20

DISCUSSION

There are many techniques to diagnose *T. vaginalis* infection. Among them, direct microscopy is really a practical and economical method with sensitivity from 60% to 75%depending on different reports [22, 23]. However, Fernando in Sri Lanka showed that the sensitivity and specificity of direct microscopy can be up to 95.83% and 100%, respectively, in comparison to culture [24].

In present study, we used microscopic examination to select the trichomoniasis patients for follow up visits; therefore the *T. vaginals* samples are examined up to 15 minutes, to improve diagnosis. The prevalence of trichomoniasis diagnosed by microscopic examination in symtomatic and asymptomatic women groups were 20 %. However such infection rate might reflect the level of sanitation and bad protection measures taken by such patients against infection and they may act as a source of transmitting the parasite to the others.

The prevalence of *T. vaginalis* varies largely by using the same methodology, wet mount preparation, from a maximum in Baghdad (38.5%) [25], Najaf (20.4%) [26], Babil (20%) [27], Baghdad (19.6%) [28], Mosul (15.5%) [29], Najaf (10.88%) [30], and other countries; Palestine (13.6) [31], Vietnam (19.3%) [32], Nigeria (10.99%) [33] to a minimum in Iraq (2.4%) [34], Turkey (8.69%) [35], France (3.1%) [36], Lao (3.7%) [37], Vietnam (2.38%) [38], Nigeria (0.37%) [39].

The present study has been noted that *T. vaginalis* infection occurs at ages of greatest sexual activity, this may agrees with many workers [26-31]. The percentage of positive cases may correlate with sexual activity so the positive cases of *T. vaginalis* tends to decrease with advanced age as compared to young sexually active women. The T- test also showed statistical significant differences in the prevalence of the trichomoniasis of all age groups (T= -2.91, P= 0.044).

Diagnosis of trichomoniasis is usually based on the presence of clinical symptoms such as vaginal discharge, irritation, burning sensation, dysuria and vaginal pH. Therefore8.3% of the women had a vaginal pH =6.5, 6.7 % have vaginal discharge, and 8.3% have vaginal itching and dysuria. *T. vaginalis* grows best at acidic environment and attaches itself by its axostyle thus creating the irritation, inflammation, and other symptoms associated with the infection by this parasite [40].

Our results revealed the frothy yellow discharge 6 (10%), white 4 (6.7%) and colourless dicharge 2 (3.3%), while the bad odor discharges gave 8 (13.3%), and no odor 4(6.7%) respectively. Our results are in

agreement with other results in different parts of the world [25, 27, 29, 32, 41, 42].

CONCLUSION

The high incidence of *T. vaginalis* in this area due to the fact that there is no safe and effective method of prevention of trichomoniasis.

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