



Diagnosis of *Trichomonas Vaginalis* in Humans

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ABSTRACT

Background: *Trichomonas vaginalis* is a parasite that is found worldwide, with infection rates approaching 30% in some areas. It is transmitted through sexual contact and direct use of other people's tools. The aims of this study to diagnose *Trichomonas vaginalis* parasitic infection in al-Muthanna province.

Materials and Methods: From the beginning of October 2024/10/27 to February 2025 2/2 a diagnostic study was conducted to investigate the presence of *Trichomonas vaginalis* in patients visiting the Teaching Maternity and Obstetrics Hospital and private gynecological clinics, as well as in local pathological analysis laboratories in the .province

Results: A total of 100 samples were examined, showing the highest infection rate among females (72.61%), with the age group 21–25 years most affected (32.14%). Married women had higher infections (59.02%) than unmarried (40.98%), and non-pregnant women showed higher rates (52.46%) compared to pregnant (47.54%). Infections were more common in rural women (53.58%) than urban (46.42%), and highest among women with primary education (35.72%) versus the lowest in university graduates (9.51%). White to gray vaginal discharge represented the highest percentage (78.57%), while brown discharge was the lowest (2.38%).

Conclusion: This diagnostic study highlights the high prevalence of parasitic infections among women more than men, emphasizing the urgent need to enhance awareness and health education in this side. The results indicate that younger and married women are particularly vulnerable to infection, which necessitates intensified efforts to educate these groups about the risks associated with such infections and effective prevention measures

Key words: Trichomoniasis ; Inflammation ; Urine ; STD ; Diagnosis



INTRODUCTION

Human trichomoniasis, caused by protozoan parasites, affects the genitourinary system in both women and men and is transmitted through sexual contact (STD), it is caused by a type of *Trichomonas*, which is a flagellated anaerobic organism [1]. Its annual infection rate reaches more than 180 million cases all over the world; the infection rate ranges from 0-65 percent depending on different geographical locations and age groups [2]. The organism grows best at a temperature of 35-37 degrees Celsius under anaerobic conditions, while the optimum pH for its growth is from 5.5-0.6 [3]. *Trichomonas vaginalis*, trichomoniasis, affects males and females, and the symptoms of the disease are more common in females than in males. This parasite is found in the lower reproductive system cavities and external vestibules of humans [4]. Therefore, the parasite infects the female vagina, urethra, and bladder [5]. Sometimes antibiotics, birth control pills, hormones, and vaginal douches can cause vaginal irritation and lead to infection, and other causes may be tight clothing, intercourse, or childbirth [5]. Vaginal discharge is the most common symptom and is profuse and associated with itching, a yellowish-green or gray color, and a strong, unpleasant odor [6]. Infected women with cervicitis are usually asymptomatic and are considered carriers of the infection. In men, symptoms appear in urethritis [7]. The rate of transmission of infection from men to women is higher, 67-100%, which indicates that the disease in men is self-limiting; it is worrying that trichomoniasis increases the risk of HIV transmission [8].

MATERIALS AND METHODS

Urine samples collection and examination

During the period from October 2024 to February 2025, 100 urine samples were collected from males and females visiting the Women and Children's Hospital, as well as private women's clinics and clinics spread across Samawah city in Muthanna province. A questionnaire was created to collect information about patients with an undiagnosed condition, including their age, gender, place of residence, social status, pregnancy status for women, and educational level. For the purpose of examining samples, urine samples were transferred to the Microbiology Laboratory at the College of Education for Pure Sciences. The urine samples were collected in special sterile containers and were immediately analyzed by placing them in a designated tube and then into a centrifuge at 2500 RPM for 15 minutes. After centrifugation, two drops of the supernatant were taken, then placed on a clean glass slide and covered with a coverslip. The samples were examined under a microscope at 40X and 100X magnification. The microscopic examination revealed the presence of parasites, epithelial cells, pus cells, crystals, and numerous white and red blood cells [9].



Staining parasites

For staining, iodine stain was utilized. A drop of urine fluid or sediment was placed on a glass slide, followed by a drop of iodine stain, and was then covered with a glass cover slip for examination under a 40X.

RESULTS AND DISCUSSION

Table (1) shows the total percentage of infection with the *Trichomonas vaginalis* parasite in males and females in Al-Muthana province. The highest infection rate recorded was 72.61% in females, while the lowest infection rate was 27.39% in males (Figure 1). The results of the current study were higher than other studies conducted in Iraq, where the infection rate was 25.86% in Mosul [10], 10.2% in Sulaymaniyah [11], and 31.0% in Baghdad. [12]. 20.49% in Kirkuk, [13], 41.6% in Baqubah, [14]. and the results of this study differed from [15] where the percentage was 85.5%. The presence of white blood cells is an indicator of inflammation and infection.

Table 1. The total percentage of infection with the *Trichomonas vaginalis* parasite in both sexes.

Sex	No. of total samples examined	No. of non-samples infected	No. of samples infected	%
Female	75	14	61	72.61
Males	25	2	23	27.39
Total	100	16	84	100

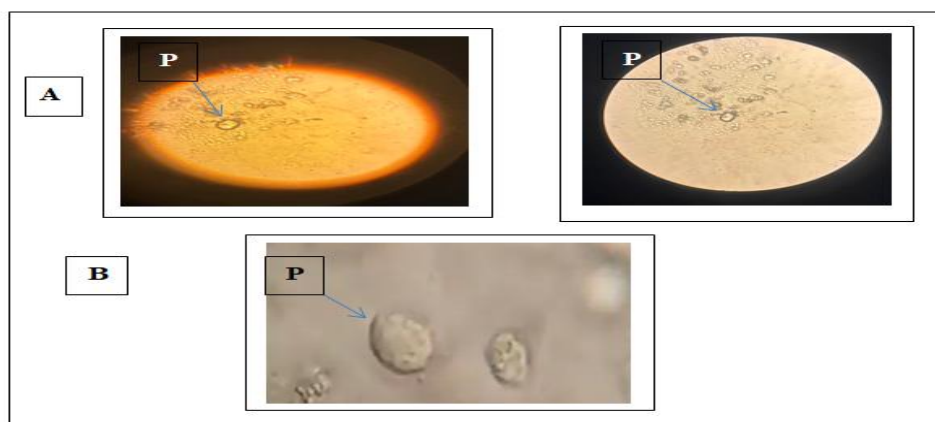


Fig. 1. The *Trichomonas vaginalis* parasite:

A-Parasite (40X) :without stain on the right ,with iodine stain on the left.

B-Parasite (100X) :without stain.

Table (2) shows the percentage of infection with *Trichomonas vaginalis* according to age groups. The incidence of vaginal trichomoniasis varies according to age groups, as shown in Table (2), the study included participants aged 10-50 years, distributed across 8 age categories. The current results indicate that the highest incidence of *Trichomonas vaginalis* infection was found in the age group of 21-25 years, with an incidence rate of 32.143%. In contrast, the lowest incidence was observed in the age group of 46-50 years, at a rate of 1.18%. It was found that the incidence is in the 21-25 age group, which is characterized by higher sexual activity and suitability for marriage [18], making the vaginal environment more conducive to the growth of *T. vaginalis*, meanwhile, the lowest incidence is in the 46-50 age group; this is due to the reduced sexual activity in women as they reach menopause, or it could be due to the acquisition of immunity or resistance against subsequent infections as a result of exposure to previous infections, in addition to the increase in pH from 6-8, making the vaginal environment unsuitable for the growth of the parasite [16]. The results of the study agreed with [17]. as the lowest percentage of 26.61% was recorded for the age group 15-24 years, and [18], where the highest percentage was for the age group 20-25 years at 36.67%. The results also agreed with [19]. where the highest injury rate was in the age group 20-25 years at 36.67%. However, the results of this study differed from the studies of [20], [21]. as the highest injury rate was recorded in the

Table 3. The percentage of infection with *Trichomonas vagainlis* according to social status

social status	Number	No. of infected females	%
Unmarried	29	25	40.98
Married	46	36	59.02
Total	75	61	100

Table 4 shows the percentage of infection with *Trichomonas vagainlis* according to pregnant and non-pregnant women. The infection rate of the *Trichomonas vaginalis* parasite varies between pregnant and non-pregnant women, where the highest rate was 52.46% for non-pregnant women, while it was 47.54% for pregnant women. The reason for the higher infection rate is the change in the vaginal environment, This indicates that trichomoniasis has a role in delaying pregnancy, as it weakens the ability to conceive through the deformities it causes in the reproductive tract, the results of this study agreed with [24]., where the highest rate was recorded at 4.5% for non-pregnant women and the lowest rate at 3.3% for pregnant women. The results of this study contradicted the study by [25], as the highest percentage was 5.7% for pregnant women and the lowest percentage was 1.8% for non-pregnant women.

Table 4. The percentage of infection with *Trichomonas vagainlis* according to pregnant and non-pregnant.

Cases	Number	No. of infected females	%
Pregnant	35	29	47.54
Non-Pregnant	40	32	52.46
Total	75	61	100

Table (5) shows the percentage of infection with *Trichomonas vaginalis* according to residence. The results were consistent with the study by [26] in southern Iraq, where the highest rate was 53.58% among rural people of both sexes and the lowest rate was 46.42% among urban people. The reason is the lack of health awareness and personal hygiene and the lack of sexual education. This was in agreement with the study by [27], which recorded an infection rate of 84.17% among rural and 15.85% among urban [28], indicating that the highest infection rate was in rural at 63.07% and in urban at 36.93%. However, it was inconsistent with the study by [14], which recorded an infection rate of 29.1% among urban and 12.5% among rural.

**Table 5. The percentage of infection with *Trichomonas vagainlis* according to residence.**

Residency	No.of examined samples	No. of infected Samples	%
Rural	57	45	53.58
Urban	43	39	46.42
Total	100	84	100%

Table (6) shows the percentage of infection with *Trichomonas vaginalis* according to educational level. The table illustrates the relationship between *trichomoniasis* infection and academic achievement, where the groups were distributed as follows: Uneducated, primary, secondary, and university, with the highest infection rate of 35.72% among those in the primary education stage and the lowest in the university education stage at 9.51%, as shown in table (6). These results agreed with [29], who recorded the highest infection rate in the primary education stage at 18.2% and the lowest rate in the university stage at 3.2%, and with [30, 31, 32], who recorded the highest rate among the uneducated of both sexes at 26.7% and 10.7% respectively. The findings also aligned with a study conducted by [24], which recorded the highest infection rate among both sexes with primary education at 21.67% and the lowest rate among university-educated people at 8.33%. The results of this study were similar to the study by [33]., which recorded the highest percentage among illiterates at 7.28% and the lowest percentage at 2.80% among those at the university level. This may be attributed to the lack or absence of health awareness among some of them, such as neglecting personal hygiene.

Table 6. the percentage of infection with *Trichomonas vagainlis* according to educational level

Education Level	No. of infected	%
Uneducated	24	28.58
Primary	30	35.72
Secondary	22	26.19
Universities	8	9.51
Total	84	100%

Table (7) shows the percentage of infection with *Trichomonas vaginalis* according to the repeat of the secretion. The current study indicated differences in the color of vaginal secretions, which are among the most important clinical symptoms for diagnosing the parasite, of the patients, 33 had frothy white to gray secretions, accounting for 78.57%, while 8 patients had



yellow to green secretions, representing 19.05% ,the remaining patient had frothy brown secretions, making up 2.38% ,the current study did not find any evidence of bloody secretions among the women visiting clinics and health centers ,it showed that vaginal secretions were more prevalent among infected women compared to other symptoms such as lower abdominal pain, itching, dysuria, and burning. The results of this current study were consistent with many studies that indicated that infection with the *Trichomonas vaginalis* parasite is associated with these symptoms, particularly vaginal secretions and vulvovaginitis [31]. Noted a clear relationship between the *Trichomonas vaginalis* parasite and itching in women experiencing vaginal secretions, with a rate of 4.8%, while the rate was lower at 1.4% in the absence of itching; this symptom's emergence is attributed to the rapid and rotational movement of the parasite and the motion of its flagella (34). The results were consistent with those recorded by [20], [35], at 18%, 58.4%, respectively. The most prominent symptoms were the presence of abundant vaginal discharges of various colors ranging from white to gray and yellowish-green. The results also aligned with [12], who indicated in their study that the main symptom of infection was vaginal discharge of whitish color at a rate of 50%.

Table 7. The percentage of infection with *Trichomonas vagainlis* according to repeat of the secretion

Discharge color	No. of infected woman	%
White to gray	33	78.57
Yellow to gerrn	8	19.05
Brawen	1	2.38
Total	42	100%

CONCLUSION

This diagnostic study highlights the high prevalence of parasitic infections among women more than men, emphasizing the urgent need to enhance awareness and health education on this side. The results indicate that younger and married women are particularly vulnerable to infection, which necessitates intensified efforts to educate these groups about the risks associated with such infections and effective prevention measures. The results reveal differences in infection rates between pregnant and non-pregnant women, indicating the need for further investigation to understand the factors and determinants that influence these dynamics. Furthermore, the impact of social and environmental factors on the prevalence of infection deserves consideration, as education plays a crucial role in raising awareness and understanding of women's health issues.



Based on these findings, the study recommends the development of comprehensive prevention strategies that address vulnerable population groups and take into account social and environmental factors. Emphasis should be placed on improving educational levels and promoting health awareness to mitigate the spread of these infections.

Conflict of interests.

There are non-conflicts of interest.

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