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Prevalence Of Trichomonas Vaginalis Infection Among Women Presenting With Vaginitis Symptoms At Al-Massara Clinic , Houn City, Libya

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A B S T R A C T

Background: *Trichomonas vaginalis* is a protozoan parasite that causes trichomoniasis, one of the most common sexually transmitted infections (STIs) worldwide. This infection primarily affects women, leading to symptoms such as vaginitis, characterized by vaginal discharge, itching, and discomfort. Despite its high prevalence, many cases remain asymptomatic or undiagnosed, contributing to its continued spread. In Libya, the epidemiological data on *T. vaginalis* infection is limited, particularly in rural and suburban areas. **Aim of study:** This study aims to investigate the prevalence of *T. vaginalis* infection in women presenting with vaginitis symptoms at Al-Massara Clinic in Houn city, Libya, providing valuable insights into the local burden of this infection. **Materials and methods:** This cross-sectional study assessed the prevalence of *Trichomonas vaginalis* infection among 300 women attending the obstetrics and Gynecology clinic at Al-Massara in Hun city, Libya, during 2022 year. Vaginal secretion samples were collected and examined using wet mount microscopy with saline solution for parasite motility and Giemsa-stained smears for detailed structural identification. **Results**: The present results revealed significant associations between infection rates and demographic, clinical, and lifestyle factors. The highest prevalence was observed among women aged 15–24 years (94.23%), with rates decreasing in older groups. Married women (62.01%) and rural residents (54.47%) exhibited higher infection rates compared to unmarried women (15.20%) and urban residents (22.28%). Infection was inversely related to educational level, with the highest prevalence in illiterate women (64.28%) and the lowest in those with higher education (18.42%). Vaginal discharge characteristics strongly correlated with infection, with 100% positivity in women with white or yellow discharge. These findings highlight the need for targeted public health strategies, including education, routine screening, and improved healthcare access, to address *T. vaginalis* infections in underserved populations.

1 Introduction

Trichomoniasis is one of the most common sexually transmitted infections (STIs), caused by the flagellated protozoan *Trichomonas vaginalis*. The primary cause is an infection of the urinal and genital tract, which may manifest as both symptomatic and asymptomatic infections. Trichomoniasis is most common in women when they have vaginitis (which is distinguished by foamy vaginal discharge, vulvar irritation, dyspareunia, and dysuria, or the frequency of urination). Men are more likely to have non-gonococcal urethritis (NGU), which is often without any symptoms, making the diagnosis difficult and allowing the disease to spread silently. The disease is difficult to detect and control early because about 40-50% of infected women and most men remain symptomatic (WHO, 2021; CDC, 2021). The scope of the infection extends to physical suffering, leading to major public health hazards. *T. vaginalis* has been demonstrated to worsen the condition of STIs, particularly HIV, and is also

associated with negative pregnancy outcomes, such as premature birth and low birth weight (Silver *et al*,. 2014; Kissinger, 2015). Complications such as pneumonia may affect neonates exposed during childbirth, which is rare to report (Van Der Pol, 2007). In different regions of the world, Trichomoniasis is common. There are approximately 156 million new cases reported globally each year. The disease's prevalence is mainly attributed to socio-economic factors like poor sanitation, limited access to healthcare, and lack of diagnostic facilities in low and middle-income countries (World Health Organization, 2021). In Libya and similar places, the fact that there are no routine screenings and laboratory diagnostic facilities makes the real burden of infection unrevealed (Roth *et al.*, 2013). Routine cervical swabs, prenatal exams, or even during check-ups are typically used to diagnose women who come in with vaginal discharge. As direct detection is still a challenge for men, empirical treatment is usually used. The high rate of asymptomatic infections, coupled with the limited success of traditional diagnostic methods, facilitates the on-going and widespread transmission of this parasite (Kissinger,2015; CDC, 2021). The primary approach to reducing the incidence of *T. vaginalis* should be to enhance diagnostic capabilities, promote routine screening, and address social determinants of health, especially in resource-poor locations. **Amin of study:** The aim of this study is to determine the prevalence of *Trichomonas vaginalis* infection among women who have vaginitis symptoms at Al-Massara Clinic in Hon City. **Amin of study:** The aim of this study is to determine the prevalence of *Trichomonas vaginalis* infection among women who have vaginitis symptoms at Al-Massara Clinic in Hon City.

2. Materials and Methods:

2.1. Study area:

Houn is one of the cities in the Aljufra region of Libya, located in the central part of the country within the Aljufra oases. It lies approximately 600 kilometres southeast of the capital, Tripoli, and is situated at an elevation of about 259 meters above sea level, it is located at approximately 29°07′16″N latitude and 15°56′25″E longitude. According to 2010 statistics, the population of Hon was approximately 30,715.

2.2. Study design:

Cross-sectional study in (300) women patients attending in Al-Massara clinic in Houn city in Libya, during 2022.Study population: The study was conducted on different age groups of (300) women patients attending in Al-Massara clinic in Houn city in Libya.

2.3. Sample collection and examination:

2.4. Vaginal secretion samples are collected from (300) patients using a sterile cotton swab, by the clinic's specialist gynaecologist, the sample was collected in the context of a vaginal or cervical gynaecology examination. After collecting the sample, it is divided into two parts, the first part mixed with a warm natural brine (0 .9% NaCl) to retain the parasite's movement for a short time to help with direct rapid microscopy (Zhenchao *et al.*, 2023) and the other part is used to examination after staining. While the second part of the sample was spread onto a glass slide and fixed with either methanol or allowed to dry for 2-3 minutes. For ten to twenty minutes, the slide was saturated with diluted Giemsa solution (1:5-10min/20 or 1:10) before staining. The slide was left to dry after washing it with distilled water and letting it dry. The slide's microscopic structures were determined by using an oil immersion lens with a magnification of 100. The identification of the parasite, nucleus, and other structures is improved by this technique, leading to a highly accurate diagnosis of Trichomonas vaginalis infection (Garber, 2005).

2.5. Statistical analysis:

The data were analyzed using SPSS software to determine frequency distributions, prevalence rates, and associations between variables. Statistical tests, including Chi-square tests, t-tests, and logistic regression, were applied to identify potential risk factors such as age, marital status, and hygiene practices. The data are expressed as numbers and percentages, with statistical significance assessed using p-values and confidence intervals to confirm the strength and reliability of associations.

3.Results:

Total prevalence of *Trichomonas vaginalis* infection among patients women: the results presented in figure and figure (1) demonstrate the prevalence of *Trichomonas vaginalis* infection among female patients. The findings indicate that 35.3% of the samples tested positive for the infection, while 64.66% were negative.

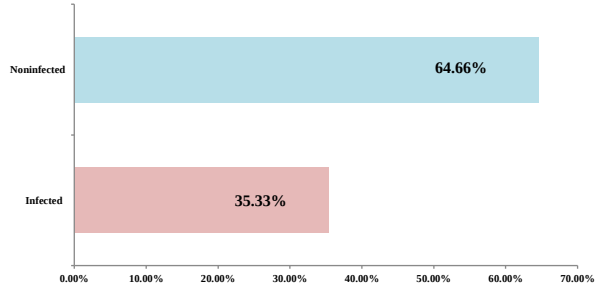

Figure (1): Total prevalence of *Trichomonas vaginalis* infection among patients women.

The prevalence of *Trichomonas vaginalis* infection of patients women according to age groups: The findings of this study demonstrate a high prevalence of

Trichomonas vaginalis infection, particularly among women aged (15-24) years, where the infection rate reached (94.23%). The parasite prevalence decreased with increase the age groups, (58.62%), (39.72%) and (7.53%) in women aged (25-34) years, (35-44) years, and 45 years respectively. These findings appeared a statistically significant relationship between age groups and *Trichomonas vaginalis* infection, with (*P*=0.000). (Table:1)

Table (1): The prevalence of *Trichomonas vaginalis* infection rate among patients women according to age groups.

Age group	Number examination women's N(%)	Infected women's No. (%)	Non infected women's No. (%)	P-value
15-24y	52	49(94.23%)	3(5.76%)	0.000
25-34y	29	17(58.62%)	12(41.37%)	
35-44y	73	29(39.72%)	44(60.27%)	
≥45y	146	11(7.53%)	135(92.46%)	
Total	300	106(35.33%)	194(64.66%)	

The prevalence of *Trichomonas vaginalis* infection of patients women according to education status: The results (table 2) of this study reveal a significant relationship between educational level and the prevalence of *Trichomonas vaginalis* infection. Non-education women exhibited the highest infection rate at (64.28%), followed by women with secondary education (34.86%) and primary education (19.27%). Women with higher education had the lowest infection rate at (18.42%). The statistically significant (*P=0.000*) suggests that educational attainment is inversely related to the infection rate, indicating that higher education may play a protective role in reducing the likelihood of *T. vaginalis* infection.

Table (2): The prevalence of *Trichomonas vaginalis* infection of patients women according to education status.

Education status	Number examination women's N(%)	Infected women's No. (%)	Non infected women's No. (%)	P-value
Illiterates	70	45(64.28%)	25(35.71%)	0.000
Primary	83	16(19.27%)	67(80.72%)	
Secondary	109	38(34.86%)	71(65.13%)	
Higher education	38	7(18.42%)	31(81.57%)	
Total	300	106(35.33%)	194(74.66%)	

The prevalence of *Trichomonas vaginalis* infection of patients women according to residency: The results from this study (Table:3) indicate a significant difference in the infection rates of *Trichomonas vaginalis* between women residing in rural and urban areas. Women in rural areas exhibited a markedly higher infection rate of (54.47%), compared to (22.28%) in urban areas, with a statistically significant (*P=0.004*). This suggests that residency appears to be a significant factor in the prevalence of *T. vaginalis* infection, with rural women facing an increased risk.

Table:(3) The prevalence of *Trichomonas vaginalis* infection of patients women according to residency

Residency	Number examination women's N(%)	Infected women's No. (%)	Non infected women's No. (%)	P-value
Rural	123	67(54.47%)	56(45.52%)	0.004
Urban	177	39(22.28%)	138(77.96%)	
Total	300	106(35.33%)	194(64.66%)	

The prevalence of *Trichomonas vaginalis* infection of patients women according to marital status: According to Table (4), there is a significant difference in the infection rates of *Trichomonas vaginalis* between married and unmarried women. The infection rate for married women was 62.01%, a significant increase over the (15.20%) rate observed among unmarried women. It can be concluded that marital status plays a significant role in the likelihood of infection, as indicated by the P value of (0.000).

Table:(4) The prevalence of *Trichomonas vaginalis* infection of patients women according to marital status.

Marital status	Number examination women's N(%)	Infected women's No. (%)	Non infected women's No. (%)	P-value
Married	129	80(62.01%)	49(22.48%)	0.000
Unmarried	171	26(15.20%)	145(84.79%)	
Total	300	106(35.33%)	194(64.66%)	

The prevalence of *Trichomonas vaginalis* infection of patients women according to characteristic of vaginal discharge: The results of this study in table (5) showed a significant relationship between the characteristics of vaginal discharge and the infection rates of *Trichomonas vaginalis*. Women with white or yellow discharge exhibited a 100% infection rate, with 38 cases recorded for white discharge and 68 cases for yellow discharge. In contrast, women with clear or bloody discharge showed no infections. This

correlation was statistically significant (*P=0.000*), emphasizing the critical role of vaginal discharge characteristics in diagnosing and identifying *T. vaginalis* infections.

Table:(5) The prevalence of *Trichomonas vaginalis* infection of patients women according to characteristic of vaginal discharge:

Characteristic of vaginal discharge	Number examination women's N(%)	Infected women's No. (%)	Non infected women's No. (%)	P-value
Clear	163	(0)	163 (100%)	0.000
White	38	38 (100%)	(0)	
Yellow	68	68 (100%)	(0)	
Bloody	31	(0)	31 (100%)	
Total	300	106 (35.33%)	194 (64.66%)	

4.Discussion:

Trichomonas vaginalis is a highly prevalent sexually transmitted parasitic infection, primarily affecting women of reproductive age. Our results indicate a decline in infection rates with age, likely due to reduced sexual activity among older women (particularly those over 45 years) and age-related changes in the immune system that enhance resistance to infection. These findings align with studies by Zhenchao Zhang et al. (2023) and Felicia et al. (2021), which reported higher prevalence in younger women (20–30 years) due to increased sexual activity and exposure, while older women benefit from reduced risk factors such as safer practices and improved healthcare access. These findings emphasize the importance of targeted prevention efforts for younger women, especially those in their reproductive years, who represent the highest risk group for *Trichomonas vaginalis* infection and the need for effective public health strategies such as routine screening, education on safe sexual practices, and the availability of treatments to reduce the burden of this STI.

Zhenchao Zhang *et al.* (2023) and Felicia *et al.* (2021) have both reported the significant influence of education on health outcomes, which are consistent with these findings. Zhang *et al.* (2023) observed that women with higher education levels are more inclined to possess better knowledge about sexual health, use healthcare services, and follow safer sexual practices, which together reduce their risk of contracting sexually transmitted infections, such as *T. vaginalis.* Similarly, Felicia *et al* (2021) cited the correlation between increased health literacy, better utilization of healthcare resources, and the ability to make informed decisions about sexual health. The high infection rate among non-education women observed in this study likely reflects lower health awareness, The lack of education can lead to cultural and social barriers that prevent non-education women from seeking treatment or discussing sexual health concerns. The findings indicate that educational interventions that aim to raise awareness about Trichomonas vaginalis and other sexually transmitted infections could be effective in decreasing infection rates, especially among less educated communities.

The present findings show a significant distinction in *Trichomonas vaginalis* infection rates among women living in rural and urban areas, which is in accordance with those of Zhenchao Zhang *et al.* (2023), who also found that rural communities are more likely to be infected with *T. vaginalis*. This disparity was attributed to a variety of factors, such as limited access to healthcare, lower levels of health awareness, and poorer living conditions, which could lead to higher rates of undiagnosed or untreated infections in rural areas. Felicia et al. (2021) emphasized that rural people often face obstacles to healthcare access, including fewer medical facilities and fewer routine screening services, which can lead to an increase in the transmission of sexually transmitted infectious disease.

The significant difference in the infection rates of *Trichomonas vaginalis* between married and unmarried women in these findings are consistent with those of Zhenchao Zhang *et al.* According to data released in 2023, women who are married have a higher chance of contracting *T. vaginalis* due to higher sexual activity within marriage, especially if sexual health practices are not consistently followed. *Zhang et al.* Married women, particularly those in long-term relationships, have been observed to have a higher risk of sexually transmitted infections (STIs) due to frequent sexual contact. Similarly, Felicia *et al.* (2021) observed that married women tend to have higher infection rates, possibly due to multiple

sexual partners (either within or outside of marriage), a lack of consistent condom use, or delayed recognition and treatment of symptoms in marital settings. The infection rate for married women may be influenced by a variety of social, cultural, and behavioral factors.

Our results showed a strong association between vaginal discharge characteristics of infected women and *T. vaginalis* infection rate. These findings align with the study by Zhenchao Zhang *et al,*. it was reported in 2023 that infections are more frequently linked to abnormal vaginal discharges, especially those with yellow or frothy appearances, which are characteristic signs of *T. vaginalis*. According to the study, these discharge characteristics are frequently caused by the inflammatory response that the parasite triggers, which changes the vaginal environment and makes the vagina more vulnerable to infection. In the same vein, Felicia et al. (2021) highlighted that the vaginal discharge features are one of the best clinical signs of the *T. vaginalis* infection. Their findings also indicated that atypical discharges, especially those that are yellowish or whitish are high indicators of the infection. Perhaps this is because of the pathophysiological effect that *T. vaginalis* infection causes by upsetting the normal flora in the vagina and therefore, the response is the hyper secretion of abnormal discharges in reaction to the parasite invasion. The absence of infection among women with clear or bloody discharge observed in this study further supports the specificity of certain discharge characteristics for *T. vaginalis* diagnosis. Clear discharge is often associated with normal physiological processes, while bloody discharge is more commonly linked to other gynecological conditions rather than STIs.

5. Conclusions:

This study identifies key factors influencing *Trichomonas vaginalis* prevalence and diagnosis, informing targeted public health interventions. Elevated risk among younger women, those with lower educational attainment, and rural residents highlights the need for integrated sexual health education and improved rural healthcare access. The correlation between marital status and infection risk necessitates tailored prevention strategies. Furthermore, utilizing vaginal discharge characteristics as a diagnostic adjunct, especially in resource-limited settings, can enhance case detection and treatment. This multifaceted approach is crucial for mitigating *T. vaginalis* impact.

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Conflict of interest: The authors declare that there are no conflicts of interest.

References:

Centers for Disease control and prevention (CDC). (2021): Trichomoniasis : Fact Sheet.

Felicia M. T. Lewis, MD,†, Ian H. Spicknall, PhD , Elaine W. Flagg, PhD , John R. Papp, PhD , Kristen M. Kreisel, PhD (2021): Incidence and Prevalence of Trichomonas vaginalis Infection Among Persons Aged 15 to 59 Years: United States, 2018. Sex Transm Dis. 2021 April 01; 48(4):232–37.\oi:10.1097/OLQ.0000000000000001383.

Garber, G. E. (2005): *The laboratory diagnosis of Trichomonas vaginalis*. Canadian Journal of Infectious Diseases and Medical Microbiology.

Ibáñez-Escribano, A., & Nogal-Ruiz, J. J. (2024): *The Past, Present, and Future in the Diagnosis of a Neglected Sexually Transmitted Infection: Trichomoniasis*. Pathogens, 13(2), 126. https: //doi.org/ 10.3390/ pathogens 3020126 &# 8203;:contentReference[oaicite:0]{index= 0}

Kissinger, P.(2015): Trichomonas vaginalis: A review of epidemiologic, clinical, and treatment issues. *BMC Infectious Diseases, 15 (1), 307*.

Moodley, P., et al. (2021): *Evaluation of diagnostic methods for Trichomonas vaginalis detection in a resource-limited*

setting. BMC Infectious Diseases, 21, 112. https://doi.org/ 10.1186/s12879-020-05618-y.

Petrin, D., Delgaty, K., Bhatt, R., & Garber, G. (1998): clinical and microbiological aspects of Trichomonas vaginalis. Clinical microbiology Reviews, 11(2), 300-317.

Silver, B.J., Guy, R. J., Kaldor, J.M., & Jamil, M.S. (2014): Trichomonas vaginalis as a cause of sexually transmitted infections: A systematic review and meta-analysis. Clinical infectious Diseases, 59(7), 930-938.

Van Der Pol, B. (2007): Trichomonas vaginalis infection: The most prevalent nonviral sexually transmitted infection receives the least public health attention. Clinical Infectious Diseases, 44(1), 23-25.

World Health Organization (WHO) (2021): Sexually transmitted infections (STIs): Fact Sheet.

Zhenchao Zhang1,2, Dongxian Li1,2, Yuhua Li2 , Rui Zhang1,2, Xianghuan Xie1,2, Yi Yao1,2, Linfei Zhao1,2, Xiaowei Tian1,[2], Zhenke Yang1,[2], Shuai Wang1, Xuejing Yue and Xuefang Mei1, (2023): Correlation between *Trichomonas vaginalis* infection and reproductive system cancer: a systematic review and meta-analysis. Zhang et al. Infectious Agents and Cancer (2023) 18:15 https://doi.org/10.1186/s13027-023-00490-2.

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