

**VAGINAL TRICHOMONIASIS: A STUDY OF FEMALE PATIENTS  
ATTENDING IJEBU-IFE GENERAL HOSPITAL, OGUN STATE,  
NIGERIA.**

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**ABSTRACT**

*Trichomonas vaginalis is an anaerobic, flagellated protozoan parasite and the causative agent of trichomoniasis. Trichomonas vaginalis is thought to be the most common non-viral sexually transmitted infection worldwide. This study investigated the prevalence T. vaginalis infection among female patients age 16-35years attending Ijebu-Ife State Hospital, Ogun State. A cross-sectional descriptive study was conducted among Two hundred (200) female outpatients between the ages of 16-35years attending Ijebu-Ife State Hospital, Ogun State. High vaginal swabs (HVS) and urine samples were collected from consenting female patients and examined for the presence of T. vaginalis using both direct wet mount microscopy and culture. Out of 200 female patients examined, 9(4.5%) and 5(2.5%) were found to be infected with T. vaginalis using High vaginal swabs (HVS) and urine samples respectively. The age group 16-20 years had the highest prevalence of 6(3%) while age group >20 years had the lowest prevalence of 3(1.5%) but the difference was not statistically significant. Results obtained from comparing HVS and urine microscopy in this study showed that HVS had a higher prevalence of 4.5% compared to urine microscopy (2.5%) and the difference in their detection was statistically not significant  $p=0.0001$ . These results may be useful for health authorities and protection against sexually transmitted diseases. The higher recovery rate obtained by using HVS microscopy confirms its advantage over urine microscopy. Vaginal trichomoniasis is slightly prevalent among the female patients attending Ijebu-Ife State Hospital, Ogun State.*

**Keywords:** Female patients, HVS, T. vaginalis , Urine microscopy, vaginal trichomoniasis

## INTRODUCTION

Trichomoniasis is the most prevalent non-viral sexually transmitted infection in the world [1]. *Trichomonas vaginalis*, the causative agent is a protozoan parasite infecting the urogenital tract of both females and males [2]. It is reported to be 250 million new cases worldwide every year [3] and Trichomoniasis accounts to almost half of curable sexually transmitted infections according to the World Health Organisation [3, 4]. In general, the infection is asymptomatic in men although it can be associated with urethral discharge and dysuria [5], while infected women can have different symptoms consisting in yellowish-green frothy discharge, purities, dysuria, and the strawberry cervix which is recognized by punctuates haemorrhagic lesions [5].

Infection by *Trichomonas vaginalis* among women can lead to serious complications such as adverse pregnancy outcomes that appear by preterm rupture of membranes, preterm delivery, low birth-weight infants, infertility, and cervical cancer [6]. Moreover, studies have shown an increased risk of HIV transmission among individuals infected by *T. vaginalis* [7]. *Trichomonas vaginalis* transmission is very heterogeneous and depends on several factors; it is established

that socioeconomic status, age, hygiene habits, sexual behaviour, phase of the menstrual cycle, and other concomitant sexually transmitted infection can play a key role on the disease burden [8].

The prevalence and the average duration of *Trichomonas* infection mainly depend on the health care seeking behaviour of population and their access to health care [9]. Primary prevention of *Trichomonas vaginalis* infection often relies on health promotion interventions to improve diseases awareness and behaviour change [10]; but male circumcision represents an important means for the prevention of *T. vaginalis* transmission and several studies have shown that partners of circumcised men are less at risk of acquiring sexually transmitted infections including Trichomoniasis [11, 12]. Oral metronidazole remains the recommended drug regimen for the treatment of trichomoniasis and concurrent treatment of sexual partners is recommended to prevent reinfections [13].

In many settings including Nigeria, patients presenting at primary care units with signs suggestive of STI (urethral discharge, vaginal discharge syndromes) are often being diagnosed and managed presumptively using

a syndromic approach based on WHO guidelines [14]. But studies have shown that a syndromic-based approach in some settings may lack sensitivity and specificity and can lead to mismanagement of several STI including trichomoniasis [15, 16]. In addition, biological confirmation of *T. vaginalis* infection in many primary care units remained at a low level due to lack of appropriate diagnostic tool and community prevalence data remained scarce [17, 18]. Thus, limited data regarding the epidemiology of Trichomoniasis are available especially among at risk population such as women of reproductive age. A better understanding in the epidemiology of *T. vaginalis* is thus needed and may help shape existing control strategies and treatment practices regarding STI in Nigeria. To overcome these gaps, this research was conducted to provide insight into the prevalence of vaginal trichomoniasis among female patients attending Ijebu-Ife General Hospital, Ogun State, Nigeria.

## **MATERIALS AND METHODS**

### **Specimen Collection and Examination**

The study population comprises of female patients aged 16-35 years attending Ijebu-Ife General Hospital, Ogun State, Nigeria. A clinical examination of the lower

genitourinary tract for signs of infection such as vaginal discharge was carried out by a gynaecologist. Incidental clinical signs, age, marital status and number of sex partners of each of these patients were also noted. High vaginal swab and urine sample were collected from each consenting study participants.

Vaginal exudates were collected using a sterile swab stick aided with sterilized speculum. Wet preparations of the vaginal exudates were made using a drop of normal saline on microscope slide covered with a cover slip and examined immediately under the microscope. Also, each urine specimen was thoroughly mixed and 15ml aliquot was centrifuged at 3,000rpm for 10 minutes. The supernatant were discarded and one drop of the sediment was placed on a glass slide and covered with a cover slip. The preparation was examined for the presence of *T. vaginalis* under the microscope. *Trichomonas vaginalis* was identified with its characteristic morphology and darting motility movement.

### **STATISTICAL ANALYSIS**

Data were entered into Microsoft excel and analyzed. Proportions were compared by Chi-square ( $\chi^2$ ) with Yates' correction or by

Fisher's exact tests using Graphpad Instat of Graphpad software Incorporation USA. A p-value of <0.05 was taken as significant.

## RESULTS

During the period of study, 200 female patients attending Ijebu-Ife General Hospital, Ogun State, Nigeria were screened for *T. vaginalis*. The demographic presentation of the study participants is shown in Table 1. Table 2 shows the prevalence of *Trichomonas vaginalis* among the female patients based on demographic presentation. The age group 16-20 years had the highest prevalence of 6(3%) while age group >20 years had the lowest prevalence of 3(1.5%) but the difference was not statistically significant (p=0.0001).

The Marital status of the study participants shows that 4 (2%) were infected among the married while 5(2.5%) were infected among the singles but the difference was not statistically significant (p=0.0001).

Based on number of sex partners, 3(1.5%) of those with single partner were infected with *T. vaginalis*. 5(2.5%) were among those with two sex partners while 1(0.5%) were infected among those with more than three sex

partners but the difference was not statistically significant (p=0.0001).

Vaginal discharge, dysuria and irritations were the clinical symptoms noticed among the patients. All the positive patients presented with at least one symptom. Vaginal discharge was the most frequent symptom observed among the patients and it also had the highest positivity rate for *T. vaginalis* (Table 3). The difference in their clinical manifestation but the difference was not statistically significant (p=0.0001).

Table 4 shows the differences in the results obtained from the two different sample sources (HVS and Urine) used in this study. HVS had a prevalence of 9(4.5%) compared to urine microscopy 5(2.5%) and the difference in their detection rate was not statistically significant (p=0.0001).

**Table 1: The demographic presentation of the study participants.**

Parameters Age	Number of examined female	Percentage (%)	P-value
16-20 years	79	39.5	0.0001
>20 years	121	60.5	
<b>Total</b>	<b>200</b>	<b>100</b>	
<b>Marital status</b>			
Married	65	32.5	0.0001
Single	131	65.5	
Divorced	04	2.0	
<b>Total</b>	<b>200</b>	<b>100</b>	
<b>No of sex partners</b>			
One	147	73.5	0.0001
Two	51	25.5	
➤ Three	02	1.0	
<b>Total</b>	<b>200</b>	<b>100</b>	

**Table 2: Prevalence of *Trichomonas vaginalis* among the female patients based on demographic presentation**

Parameters Age	Number of examined female	Positive Samples		P-value
		High vaginal swabs (HVS)	Urine microscopy	
16-20 years	79	6(3%)	3(1.5%)	0.0001
>20 years	121	3(1.5%)	2 (1%)	
<b>Total</b>	<b>200</b>	<b>9(4.5%)</b>	<b>5(2.5%)</b>	
<b>Marital status</b>				
Married	65	4(2%)	2(1%)	0.0001
Single	131	5(2.5%)	3(1.5%)	
Divorced	04	--	--	
<b>Total</b>	<b>200</b>	<b>9(4.5%)</b>	<b>5(2.5%)</b>	
<b>No of sex partners</b>				
One	147	3(1.5%)	2(1%)	0.0001
Two	51	5(2.5%)	2(1%)	
➤ Three	02	1(0.5%)	1(0.5%)	
<b>Total</b>	<b>200</b>	<b>9(4.5%)</b>	<b>5(2.5%)</b>	

**Table 3: Evaluation of *Trichomonas vaginalis* among the female patients by Clinical Manifestation (n=200)**

Symptoms	Frequency	Positive	Percentage (%)	P-value
Vaginal discharge	27	5	2.5	0.0001
Dysuria	19	2	1	
Irritation	19	2	1	
Total	65	9	4.5	

**Table 4: Evaluation of *Trichomonas vaginalis* among the female patients by Sampling Method**

Specimen	Number Examined	Number Positive	P-value
High vaginal swab	200	9(4.5%)	0.0001
Urine	200	5(2.5%)	

## DISCUSSION

*Trichomonas vaginalis* is one of the most common STI in the world but its prevalence is very heterogeneous across countries [19, 20]. In this study, 9(4.5%) of the female patients attending Ijebu-Ife General Hospital, Ogun State were found to have *T. vaginalis* infection. The prevalence of *T. vaginalis* in this current study was greater compared with 4.8% obtained by Roger et al. [21] but the disease distribution across age groups remained heterogeneous; female with age range 16-20 years were the most infected population (3%). These findings are inconsistent with data from other studies that showed that 25- to 45-year-old women are at higher risk of being infected by *T. vaginalis*

[22-23]. Trichomoniasis in that age group is more prevalent due to the fact that it is a sexually active and reproductive age group, which is predisposing factor for infection [23]. Thus, strategies aiming at improving disease awareness in this high-risk group are needed to further improve trichomoniasis prevention.

5(2.5%) of the patients infected with trichomoniasis had vaginal discharge, 2(1%) had pain while passing urine while 2(1%) had irritation while passing urine. Greater observation was recorded by Wolner-Hanssen et al. [24] where 42% had vaginal discharge. Several studies have also associated *T. vaginalis* with symptoms of yellow vaginal discharge and vulva irritation,

as well as signs of purulent vaginal discharge, and vulva and vaginal erythema [24].

Currently, the “gold standard” for the diagnosis of trichomoniasis is culture and traditionally, this has been accomplished through cultivation in Diamond’s medium, which is not widely available and thus used mainly for research purposes. However, new commercially available cultural methods have been shown to be as good as the traditional research method [25].

The most common means of routine diagnosis still remains microscopy. This study has demonstrated that HVS microscopy

has a better detection than urine microscopy. This result agrees with what has been previously shown by other authors [26-27].

The most important available options for prevention and control is through reduction in the community prevalence of the disease. This may be better achieved through routine STI screening in individual and pregnancy especially among the young people. Routine screening for trichomoniasis should be incorporated into antenatal care. At the same time, there is a need to educate the people on the need for good personal hygiene and safe sex practices.

## REFERENCES

1. S. Herbst de Cortina, C. C. Bristow, D. Joseph Davey, and J. D. Klausner, “A systematic review of point of care testing for chlamydia trachomatis, neisseria gonorrhoeae, and trichomonas vaginalis,” *Infectious Diseases in Obstetrics and Gynecology*, vol. 2016, Article ID 4386127, 17 pages, 2016. View at: [Publisher Site](#) | [Google Scholar](#)
2. M. Mao and H. L. Liu, “Genetic diversity of *Trichomonas vaginalis* clinical isolates from Henan province in central China,” *Pathogens and Global Health*, vol. 109, no. 5, pp. 242–246, 2015. View at: [Publisher Site](#) | [Google Scholar](#)
3. WHO, *Global Incidence and Prevalence of Selected Curable Sexually Transmitted Infections 2008*, World Health Organization, Geneva, Switzerland, 2012.
4. D. F. Harp and I. Chowdhury, “Trichomoniasis: evaluation to execution,” *European Journal of Obstetrics & Gynecology and Reproductive Biology*, vol. 157, no. 1, pp. 3–9, 2011. View at: [Publisher Site](#) | [Google Scholar](#)
5. M. Arbabi, M. Delavari, Z. Fakhrieh-Kashan, and H. Hooshyar, “Review of trichomonas vaginalis in Iran, based on epidemiological situation,” *Journal of Reproduction and Infertility*, vol. 19, no. 2, pp. 82–88, 2018. View at: [Google Scholar](#)
6. R. N. Fichorova, “Impact of *T. vaginalis* infection on innate immune responses and reproductive outcome,” *Journal of Reproductive Immunology*, vol. 83, no. 1-2, pp. 185–189, 2009. View at: [Publisher Site](#) | [Google Scholar](#)

7. B. Van Der Pol, C. Kwok, B. Pierre-Louis et al., "Trichomonas vaginalis infection and human immunodeficiency virus acquisition in African women," *The Journal of Infectious Diseases*, vol. 197, no. 4, pp. 548–554, 2008. View at: [Publisher Site](#) | [Google Scholar](#)
8. D. F. Grama, L. d. Casarotti, M. G. Morato et al., "Prevalence of Trichomonas vaginalis and risk factors in women treated at public health units in Brazil: a transversal study," *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 107, no. 9, pp. 584–591, 2013. View at: [Publisher Site](#) | [Google Scholar](#)
9. E. D. Riley, J. Cohen, S. E. Dilworth et al., "Trichomonas vaginalis infection among homeless and unstably housed adult women living in a resource-rich urban environment," *Sexually Transmitted Infections*, vol. 92, no. 4, pp. 305–308, 2016. View at: [Publisher Site](#) | [Google Scholar](#)
10. K. Bouchemal, C. Bories, and P. M. Loiseau, "Strategies for prevention and treatment of Trichomonas vaginalis infections," *Clinical Microbiology Reviews*, vol. 30, no. 3, pp. 811–825, 2017. View at: [Publisher Site](#) | [Google Scholar](#)
11. R. C. Bailey, S. Moses, C. B. Parker et al., "Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial," *The Lancet*, vol. 369, no. 9562, pp. 643–656, 2007. View at: [Publisher Site](#) | [Google Scholar](#)
12. B. Avert, D. Taljaard, E. Lagarde, J. Sobngwi-Tambekou, R. Sitta, and A. Puren, "Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial," *PLoS Medicine*, vol. 2, no. 11, Article ID e298, 2005. View at: [Publisher Site](#) | [Google Scholar](#)
13. L. H. Bachmann, M. M. Hobbs, A. C. Seña et al., "Trichomonas vaginalis genital infections: Progress and challenges," *Clinical Infectious Diseases*, vol. 53, no. 3, pp. S160–S172, 2011. View at: [Publisher Site](#) | [Google Scholar](#)
14. WHO, *Guidelines for the Management of Sexually Transmitted Infections*, World Health Organization, Geneva, Switzerland, 2004.
15. M. S. Barry, A. Ba Diallo, M. Diadiou et al., "Accuracy of syndromic management in targeting vaginal and cervical infections among symptomatic women of reproductive age attending primary care clinics in Dakar, Senegal," *Tropical Medicine & International Health*, vol. 23, no. 5, pp. 541–548, 2018. View at: [Publisher Site](#) | [Google Scholar](#)
16. A. Kaida, J. J. Dietrich, F. Laher et al., "A high burden of asymptomatic genital tract infections undermines the syndromic management approach among adolescents and young adults in South Africa: Implications for HIV prevention efforts," *BMC Infectious Diseases*, vol. 18, no. 1, p. 499, 2018. View at: [Google Scholar](#)
17. B. Vuylsteke, "Current status of syndromic management of sexually transmitted infections in developing countries," *Sexually Transmitted Infections*, vol. 80, no. 5, pp. 333–334, 2004. View at: [Publisher Site](#) | [Google Scholar](#)
18. Z. M. Chirenje, N. Dhibi, H. H. Handsfield et al., "The etiology of vaginal discharge syndrome in Zimbabwe: results from the

- Zimbabwe STI etiology study,” *Sexually Transmitted Diseases*, vol. 45, no. 6, pp. 422–428, 2018. View at: Publisher Site | Google Scholar
19. P. Kissinger, “Epidemiology and Treatment of Trichomoniasis,” *Current Infectious Disease Reports*, vol. 17, no. 6, p. 484, 2015. View at: Publisher Site | Google Scholar
  20. C. B. Menezes, A. P. Amanda Piccoli Frasson, and T. Tasca, “Trichomoniasis – are we giving the deserved attention to the most common non-viral sexually transmitted disease worldwide?” *Microbial Cell*, vol. 3, no. 9, pp. 404–418, 2016. View at: Publisher Site | Google Scholar
  21. Roger C. T., Khadime S., Rougyatou K., Lamine D., Doudou S., Souleye L., Khardiata D., Babacar F., Thérèse D., Cheikh T. N., and Ahmet Y. Sow. A Study of *Trichomonas vaginalis* Infection and Correlates in Women with Vaginal Discharge Referred at Fann Teaching Hospital in Senegal. *Journal of parasitology research*. Volume 2019 |Article ID 2069672 | <https://doi.org/10.1155/2019/2069672>
  22. M. Sutton, M. Sternberg, E. H. Koumans, G. McQuillan, S. Berman, and L. Markowitz, “The prevalence of *Trichomonas vaginalis* infection among reproductive-age women in the United States, 2001-2004,” *Clinical Infectious Diseases*, vol. 45, no. 10, pp. 1319–1326, 2007. View at: Publisher Site | Google Scholar
  23. P. Madhivanan, M. T. Bartman, L. Pasutti et al., “Prevalence of *Trichomonas vaginalis* infection among young reproductive age women in India: Implications for treatment and prevention,” *Sexual Health*, vol. 6, no. 4, pp. 339–344, 2009. View at: Publisher Site | Google Scholar
  24. Wolner-Hanssen P, Krieger JN, Stevens CE, Kiviat NB, Koutsky L, Critchlow C, DeRouen T, Hillier S and Holmes KK. Clinical Manifestations of Vaginal Trichomoniasis. *JAMA*. 26:571-6, 1989.
  25. Draper D, Jones W, Heine RP, Beutz M, French JI and McGregor JA. *Trichomonas vaginalis* Weakens Human Amniochorion in an In Vitro Model of Premature Membrane Rupture. *Infect Dis Obstet Gynecol*. 2:267-74, 1995.
  26. Sharma P, Malla N, Gupta I, Ganguly NK and Mahajan RC. A Comparison of Wet mount, Culture and Enzyme Linked Immunosorbent Assay for the Diagnosis of Trichomoniasis in Women. *Trop Geogr Med*. 43:257-60, 1991.
  27. Stary A, Kuchinka-Koch A and Teodorowicz L. Detection of *Trichomonas vaginalis* on Modified Columbia Agar in the Routine Laboratory. *J Clin Microbiol* 40:3277-80, 2002.

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