

## Study on the Incidence of Trichomoniasis among Women attending General Hospital Numan, Adamawa State

Bode A. S. and Yafiryau E. P.

Department of Zoology, Adamawa State University Mubi, Adamawa State University Nigeria

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### Abstract

*Trichomonas vaginalis* is one of the most common sexually transmitted infection (STI) in the world but its prevalence is very heterogeneous across countries (Menezes, 2016). World Health Organization, WHO (2001) has reported that *Trichomonas vaginalis* accounts for almost half of all curable STIs. A total of 400 High Vaginal Swabs (HVS) samples were collected from women that visited General Hospital Numan. These samples were observed under the microscope using wet preparation method. The results obtained were written/grouped in tables for easy analysis, capturing bio-data of subjects such as age and residence, which revealed that out of the 400 samples, 96 (24%) women tested positive for *Trichomonas vaginalis* infection. Furthermore, this research further revealed that sexually active women within the age range of 13-20 were the high-risked age group with incidence of 34 (31.5%).

**Keywords:** Trichomoniasis, Sexually Transmitted Infection, *Trichomonas vaginalis*, Hygiene, General hospital Numan

### Introduction

*Trichomonas vaginalis*, an anaerobic, parasitic, flagellated protozoan, is the causative agent of trichomoniasis and is regarded as one of the most prevalent non-viral sexually transmitted infection worldwide with an estimated 180 million infection acquired annually worldwide (Charp *et al.*, 2011). Humans are the only known host with the trophozoite transmitted principally through sexual intercourse, and rarely through fomites (Donne, 2000).

In women, the disease encompasses broad range of symptoms ranging from a severe irritation with frothy malodorous discharges to a relatively asymptomatic carrier state. But the main clinical manifestation of Trichomoniasis is vaginitis, urethritis and prostatitis. The outcome of infection with *Trichomonas* may be due to genetic variability of the isolates and the host immune response (Hammil, 1989). Several studies have proven that pregnant women infected with this parasite may be at an increased risk of adverse birth outcomes such as premature rupture of membranes, premature labour, low birth weight and post abortion or post-hysterectomy infection (Coth *et al.*, 2007 and Soper *et al.*, 2009). As with other sexually transmitted

infections, *Trichomonas* infection can increase the risk of transmission of HIV infection (Chigozie *et al.*, 2002).

Transmission of *Trichomonas vaginalis* to neonates during passage through an infected birth canal is also possible (Flint, 2013). Complications such as abnormalities of the major organ systems as well as infections in form of pneumonia and conjunctivitis may also occur. Neonatal infection is infrequently reported, and has been noted to cause urinary tract infection *vaginalis* in infants. In addition, infants with *Trichomonas vaginalis* cultured from nasopharyngeal secretions have been reported to have respiratory distress (GEG, 2001).

*Trichomonas vaginalis* can be isolated from vaginal, prostatic or urethral secretions of semen and urine of infected individuals. The most commonly employed diagnostic methods are direct microscopic examination of wet mount preparation and culture techniques. Combination of both wet mount examination and culture has been recommended as being more effective in establishing diagnosis than either one alone (Cochrane, 2000). Direct examination of wet mount preparation of clinical specimen is the most rapid and least expensive

technique for identifying *Trichomonas vaginalis* hence the most commonly used technique. The method has however been reported insensitive for the diagnosis of the disease, particularly in male patients. Other methods include antigen detection methods, plastic envelope methods, in-pouch system, cell culture, staining techniques, serological and DNA techniques.

*Trichomonas vaginalis* is regarded the most common, curable sexually transmitted disease in the world (Johnston and Mabey, 2008). It is also one of the three most common vaginal infections in women (Hammil, 1989). Trichomoniasis affects about 180 million women worldwide annually (Donne, 2000) and at least 270 million individuals globally (Bowden, 2000), with 3 million American affected annually. (Wilson, 2001). The rate of *T.vaginalis* in Nigeria varies from 19.6%-46.5% in Maiduguri-Northern Nigeria to 2.5%- 40% in Enugu-Eastern Nigeria (Chigozie-Un *et al.*, 2002). In Africa, it is estimated that 2 - 50% of the population carries the infection (WHO, 2001). Trichomoniasis is caused by one cell protozoan parasite of the subphylum, Mastigophora, Phylum Saccomastigophora, Class Zoomastigophora, Family Trichomonadidae, Genus-*Trichomonas* and Species *vaginalis* (Paniker, 2002). The ovoid - shaped adult parasite called trophozoite is the infective stage; both women and men are infected.

Although infection with *Trichomonas vaginalis* is frequently asymptomatic and self-limited, it can however cause urethritis in men and *vaginalis* in women. Vaginal discharge, vulva-vaginal soreness, dysurea and irritation are usually experienced by symptomatic women with trichomoniasis. Apart from multiple sexual activities, masturbation using contaminated finger, poor hygiene as in the use of infected towels and sharing of other form of clothing and low social economic status has contributed immensely to its prevalence (Livegood, 1991 and Lossick, 1991).

Transmission of infection usually occurs through sexual intercourse, contaminated toilet seats may also be possible and it affects both sexes equally. A large population of infected individuals may remain asymptomatic and thus can act as carriers and a potential source of infection. Women however, appear more susceptible to the infection than men generally as it infect the lower genito-urinary tract

of both sexes and are mostly found in sexually active individual between 16-35 years (Jatau, 2000). *Trichomonas vaginalis* trophozoite is among the most durable protozoan organisms that can survive for up to 24hours in urine, semen or even water samples and has the ability to persist on fomites with a moist surface up to one or two hours (Njoku, 2000). Trichomoniasis occur in females (males rarely exhibit symptoms). If the normal acidity of the vagina is shifted from a semi acidic PH (3.8- 4.2) to a much more basic one (5.0-6.0), it becomes conducive for *Trichomonas vaginalis* (Njoku, 2000). The incidence of Trichomoniasis depends on the population screened/examined. Certain factors such as poor personal hygiene, multiple sex partners, socio - economic status and underdevelopment are documented to be associated with high incidence of infection (Décastero, 2012). Sexually transmitted diseases are becoming more prevalent with diverse complications. Pregnant women who suffer these diseases may end up with the death of foetus, the new born or the birth of a child who is seriously ill (Paniker, 2002).

The control of trichomoniasis seems to have been a success in developed countries because of regular access to health care facilities where as it has remained endemic in sub-Sahara Africa including Nigeria. *Trichomonas vaginalis* infections, has neither been the focus of intensive study nor of active control programs and this neglect is likely a function of the relatively -mild nature of the disease (Wolner, *et al.*, 2000), however, in addition to the association of *Trichomonas vaginalis* with adverse pregnancy outcome, increasing evidence suggest that the pathogen may serve as a cofactor in Human Immuno-deficiency Virus (HIV) transmission (Muelent *et al.*, 1992). Hence the need for improved understanding of the natural history, pathology, treatment and prevention of the common protozoan parasite cannot be overstated. A regular screening and treatment will also reduce adverse effects in pregnancy (Bowden, 2000).

Trichomoniasis being a sexually transmitted disease (STD) caused by *Trichomonas vaginalis* with the following adverse complications such as preterm birth, pelvic inflammatory disease and infertility in reproductive age women. (Cherpes *et al.*, 2011). It is one of the major health problem women faced and the most common curable Sexually Transmitted Infections in young, sexually active women

(Weinstock *et al.*, 2004). It is mostly asymptomatic and often ignored and/or overlooked. This tends to have a negative implication on women of reproductive age. It is in this regard that the research was conducted to determine the incidence of Trichomoniasis among women attending General Hospital Numan, Adamawa State.

There is scanty information on the incidence of *Trichomonas vaginalis* in Numan. Therefore this study will provide information on the incidence of *Trichomonas vaginalis* in Numan Local Government and it will be useful in intervention strategy against the disease among women in Adamawa State.

This research work is limited to the survey of trichomoniasis among women attending General Hospital Numan. The significance of this research is to create awareness as regard to the incidence of trichomoniasis among patients visiting General Hospital Nilman and to reveal the extent of the infection among reproductive age women.

## **Materials and Methods**

### **Study Area**

This study was carried out at General Hospital Numan. Numan metropolis lies between latitude 90°28' North, Longitude 12°2' East on the confluence of Benue River and Gongola River. The area has a tropical climate with an average temperature of 91°F. It has an average relative humidity ranging from 27% to 100% and an average rainfall of about 6.8 inches (Adebayo, 2020). It is of the Guinea Savannah vegetation zone which spread over the Local Government Area. Numan, also known as Nomweh (meaning 'hilltop') is surrounded by three local government areas of Adamawa State: Demsa, Lamurde, and Guyuk to the South, North and East respectively (Adebayo and Tukur, 2020). Numan town is located about 30 miles (50km) from the State capital, Yola. The predominant ethnic group in the town are the Bwatiye people. The Bwatiye people are led by a First Class King known as the Hama Bachama, who is the paramount ruler of the Bwatiye Kingdom who's Voti (palace) is in Numan the administrative seat of the throne. Other ethnic group in Numan are Bata, Mbula, Jenjo, Jukun etc. while farming, and cattle rearing and fishing are known to be the major occupation (Adebayo and Uyi, 2010).

### **Method of Sample Collection**

A total of 400 samples were collected randomly with the bio-data of women, such as Age and Residence from General Hospital Numan. These women were supplied with clean, dry, wide-mouth sample container with fitting cap for collection of samples from the *Vagina* or Urinary tract of females.

### **Preparation of Reagents for the Detection of Trichomonal Vaginalis**

#### **Preparation of Normal Saline**

About 8.5g of NaCl was weighed and dissolved in 100ml of warm water and was allowed to stand for 3 to 5 minutes. It was filtered with filter paper into 10cm<sup>3</sup> conical flask to medium line marked on the flask. (Adeoye, 2011).

#### **Ethical consideration:**

#### **Examination of Vaginal Sample**

The examination of vaginal sample was carried out in the Medical Laboratory of General Hospital Numan, Adamawa State.

### **Microscopic Examination of Trichomonas Vaginalis**

Each sample was examined microscopically for the presence of *Trichomonas vaginalis*; colour and odour of discharge (Adeoye, 2011).

### **Microscopic Examination Procedure**

#### **Wet Mount Preparation Method (Adeoye, 2011)**

A drop of normal saline or (0.3ml) was introduced into the pack of each sample swab and mixed, by shaking vigorously to wet the swab. A drop of the mixture of each sample was placed on clean-grease free slide with the aid of Pasteur pipette, covered with the cover slip and examined microscopically with low power (x10) and dry high power (x40) objectives (Acholonu, 1998).

### **Data Analysis**

The data obtained was analysed by simple percentage and chi-square test (SPSS version 21). Descriptive statistics and percentages were used in presentation of data in tabular form. Chi-square test (x) was used to compare the incidence of trichomoniasis based on age group and residence of women that visited General Hospital Numan during the period of research. P-value less than or equal to 0.05 were considered as statistically significant.

### **Results**

A total of 400 high vaginal swab was collected and

examined microscopically out of which 96 (24%) were positive. Age related incidence is shown in Table 1. *Trichomonas vaginalis* infection was recorded in all the age group. The highest incidence was recorded in age group 13-20 (31.5%) followed

by age range 21-30 (28.6%), 41-50 (21.7%), 31-40 (21.4%), 51-60 (6.7%) and 61-70 (0%) respectively. There was a significant differences in infection between age group based on Chi-square analysis. ( $X^2 = 60.100, p = 0.000$ )

**Table1:** Incidence of *Trichomonas vaginalis* based on age group (years)

Age group	No. Examined	No. Positive (%)
13-20	108	34 (31.5)
21-30	112	32 (28.6)
31-40	84	18 (21.4)
41-50	46	10 (21.7)
51-60	30	2 (6.7)
61-70	20	0 (0.0)
<b>Total</b>	<b>400</b>	<b>96 (24.0)</b>

( $X^2 = 60.100, df = 5 p = 0.000$ )

**The incidence of *Trichomonas vaginalis* based on Residence**

Table 2 shows the incidence of *Trichomonas vaginalis* based on Residence. 400 persons were examined out of which 96 (24.0%) were infected.

The Rural dwellers recorded the highest incidence of 70 (31.5%) while urban settlers recorded 26 (14.6%) positive subjects (women). However, Chi-square analysis showed that infection among the different residence does not differ from each other.

**Table 2:** The incidence of *Trichomonas vaginalis* based on Residence

Residence	No. Examined	No. Positive (%)
Rural	222	70 (31.5)
Urban	178	26 (14.6)
<b>Total</b>	<b>400</b>	<b>48 (24.0)</b>

( $X^2 = 2.420, df = 1 p = 0.120$ )

**Discussion**

*Trichomonas vaginalis* is one of the most common Sexually Transmitted Infections (STI) in the world but its prevalence is very heterogeneous across countries (Menezes, 2016). WHO (2001) has reported that *Trichomonas vaginalis* accounts for almost half of all curable STIs.

The study conducted described the incidence of *Trichomonas vaginalis* among women, exploring the high-risk age group and residence. The result Obtained, from the study carried out in General Hospital Numan revealed that out of 400 samples being analysed 96 (24.0%) were found to be positive. Table 1 shows the incidence of trichomoniasis based on age group. Age-group of 13-20 years had the highest incidence of 34 (31.48%) followed by age-range 21-30 (28.6%), 41-50 (21.7%), 31-4 0 (21.4%), 51-60 (6.67%) and the least was the age-group of 61-70 (0%). These findings are not consistent with the research carried out by Jatau (2000) which showed that *Trichomonas vaginalis*

infection is more prevalent among 16-25 years age group followed by 26-35 with a prevalence rate of 87% recorded in age range 15-34 years. *Trichomonas vaginalis* is more prevalent in that age group due to the fact that it is a sexually active and reproductive age group which is predisposing factor for infection (Grama *et al.*, 2013). They are also most likely to be naive/ignorant, unemployed and indulge in unprotected sex. Thus strategies aiming at improving disease awareness in this high-risk group are needed to further improve the prevention.

The incidence of *Trichomonas vaginalis* recorded in this study (24.0%) is lower than what was reported in other African settings such as Zimbabwe where a prevalence frequency of 95% was found (Gregson *et al.*, 2001). In contrast, higher prevalence was recorded among imprisoned women (WHO, 2001). These variations can be due to variability in terms of disease exposure (Grama *et al.*, 2013) as well as different diagnostic methods across studies. Unlike other studies that showed higher prevalence among

married women, (Azambakhtiar *et al.*, 2018; Arbabi, 2014), this study revealed that young women were more likely to develop trichomoniasis. However, without additional information on marital status, participant's sexual behaviour, educational level, or knowledge about STI, it was impossible to clearly explain the relationship between, marital status and incidence of Trichomoniasis.

Epidemiological studies have established that low educational level, smoking and sexual behaviours are significantly associated with *Trichomonas vaginalis* infection Coth *et al.*, 2007; Grama *et al.*, 2013). But this study did not collect information on these variables. The study has some limitations in the current study, *Trichomonas vaginalis* detection was only based on Wet Mount Smear Microscopic Examination as part of a routine standard practice and additional investigations such as culture or PCR were not carried out. This may have lowered the parasite detection rate. It is well established that among the available methods, at least two methods are better for diagnosis of *Trichomonas vaginalis* example culture and wet mount microscopy (Arbabi, 2014).

Table 2 shows the incidence of trichomoniasis based on Residence. The results indicate that during the period of this research work, 222 samples obtained were from rural dwellers out of which 70 (31.53 %) were infected with *Trichomonas vaginalis*. While Patients that visited the hospital from the Urban areas were 178 out of which 26 (14.6 %) were positive. Thus the rate of trichomoniasis infection occurred more among Rural dwellers than Urban dwellers in which it is in consonance with the report of Donne (2000). According to, Njoku, 2000 and Maefi *et al.*, 2016, *Trichomonas vaginalis* has been implicated in contaminated shared toilets Ukoli, (2011) especially stated that other means of vaginal contamination apart from sexual intercourse may be as a result of the non-veneral mode of transmission of the parasite which may remain viable in urine for 30-45 minutes. He emphasized that such agents undoubtedly occur especially in areas with poor environmental and personal hygiene and females with their open biological nature could easily be infected. This explains why *Trichomonas vaginalis* has been recently considered a disease associated with poverty (Praise, 2014).

## Conclusion

*Trichomonas vaginalis* was found among women with vaginal discharge with a higher burden among sexually active women. Strategies aiming at improving disease awareness among these high-risk groups are needed and should include health promotion, education and prevention with regard to sexual behaviour. However, extensive epidemiological data are needed to better understand the epidemiology of *Trichomonas vaginalis*.

## Recommendations

Based on these research findings, the following recommendations are suggested:

- Further investigations should be carried out via other techniques/methods such as culture and PCR.
- Residence should be enlightened on the existence of *T. vaginalis* infection and safety measures on how to prevent and cure it.
- Since the high-risk age group are sexually active women, intense sex education should be carried out in Primary, Secondary and Tertiary institutions.
- Medical health personnel, community and religious leaders should visit both the Urban and Rural dwellers and encourage them to improve or practice good hygiene.
- Government should sponsor the distribution of Metronidazole at a subsidized rate to rural dwellers.

## References

- Acholoñu, A. D. W. (1998). Trichomoniasis: a little recognized transmitted L<sub>1</sub>— diseases but with grave consequences. *Academic of sciences Lagos* 1: 8-9
- Adebayo R. A. and Uyi, N.O. (2010). Biological control of invasive weed species: Nigerian experience. *International Journal of Agricultural Research* 5: 1100-1106 URL <http://scialert.net/abstract>.
- Adebayo, A. A. (2020). The Agroclimatology of Rice Production in Adamawa State. Ph.D Thesis, Department of Geography, Federal University of Technology, Minna.
- Adebayo, A. A. and Tukur, A. L. (2020). Adamawa State in Maps. Department of Geography, Moddibo Adama University Yola, Adamawa State, Nigeria 21<sup>nd</sup> edition

- Adeoye, M.O., and Popoola, S.C. (2011). Teaching Effectiveness, Accessibility, and use of Library and Information Resources among Teaching Staff of Schools of Nursing in Osun and Oyo State, Nigeria. *Library Philosophy and Practice*. Retrieved from <http://unllib.unl.edu/LLP/>.
- Arbabi, K. Y., (2014) An outbreak Sexually Transmitted Parasitic Disease. Investigation report. *Journal of Microbiology* 20: 91-97
- Azambakhtiar, S. Lalata E., Braxton, J., Schwebke, J. R. and Weinstock, H. S., (2018). Trichomonas in selected US sexually transmitted disease clinics: testing, screening and prevalence. *Sexually transmitted diseases* 40: 865-69.
- Bowden, F. Y., and Garnett, O. P. (2000). *Trichomonas vaginalis* epidemiology. Model of treatment, intervention and sexually transmitted infection. *Journal of the American Medical Association* 76: 284 - 356.
- Cherpes ,T.L., Wiesenfeld, H.C4 Mela Kant J.A., Consenting, L.A., Meyn., and Ruler, S.L. (2006). The association between pelvic inflammatory disease, *Trichomonas vaginalis* infection and positive herpes simplex virus Styped serology. *Sexually Transmitted Diseases* 33: 747-752
- Chigozie, J.U., Cletus, D.C., and Ugwuoru, E. (2002). *Trichomonas Vaginalis* infection among pregnant women in South Eastern Nigeria. The public health significance. *The internal Journal of Gynecology and obstetrics* 138: 156-163
- Cochrane, J. (2000). Complication of STDs *British Medical Journal* 110: 134- 139
- Cotch, M. F., Pastorek, J. G., Nugent, R. P., Yerg, D. E., Martin, D. H., and Eschenbanch, D. A. (1991). Demographic and behavioral predictors T.vaginalis infections among pregnant women. The Vaginal infections and prematurity study Group. *Obstset Gynecology* 78: 1087-1092
- Coth , P., Protman, R. M., Bai, G., Sakamoto, J., Schutte, ABdo, Z., Forney, L. J., and Rael, J. (2007). Temporal dynamics of the human vaginal microbiota. *Science Translational Medicine* 4:132-152.
- Decastro F. J. (1989). High prevalence of trichomoniasis infection in —‘ adolescents. *Clinical pediatrics* 28:33-34
- Donne, M. K. (2000). Pathogenic Protozoa in man. *Journal of Farasitology*, 175: 435-442.
- Flint, M., and du Plessis, S.S. (2013). *Trichomohas vaginalis* in Sub-Saharan Africa: occurrence, and diagnostic approaches for the male partner. *Medical Technology South Africa* 27:1011-5528
- GEG, (2001). National guidelines on the management of *Trichomonas vaginalis* — clinical effectiveness group (Association of Genito Urinary Medicine and the Medical Society, for the study of venereal disease) [www.bashh.org](http://www.bashh.org). *Obstetrics and Gynecology* 110:134-139.
- Gramma, S., Theron, G. B., Odendaal, H. J., and Chalkey, L. J. (2013). Prevalence of genital mycoplasma, ureaplasmas and chlamydia in pregnancy. *American Journal of Obsterics and Gynecology*. 29: 698-701.
- Gregson V, R., Ward, J., Wand, H., Rumbold, A., Garton, L., Hengel, B., Silve, B., Taylor-Thomson, D., Knox, J., McGregor, S., Dyda, A., Fairley, C., Maher, L., Donova, B., and Koldor, J. (2001). Co-infection with Chlamydia trachomatis, Neisseria gonorrhoeae and trichomonas vaginalis: a cross-sectional analysis of positivity and risk factors in Atlanta, United State of America.
- Hammil H. A. (1989). *Trichomonas vaginalis*. *Obstetr and Gynecol chin North AM*. 16: 531-540
- Jatau, S.B. (2000). Urogenital trichomoniasis. *Nigerian Journal of gentio-Urinary Med*.7: 54-55
- Johnston, V.J., and Mabey, D.C. (2008). Global epidemiology and control of *Trichomonas vaginalis*. *Current opinion in infectidus Diseases* 21:56-64
- Johnson LF and Lewis DA (2008) The effect of genital tract infections On HIV-1 -1 shed4ing in genital tract: a systematic review and metaanalysis *sexually Transmitted Diseases* 35; 946-959
- Krieger, J. N., and Jenny, C. (1993). Clinical Manifestation of trichomoniasis in Men. *International Medical Journal* **118: 8844-8849**

- Livegood, B. (1991). Sexually transmitted parasitic disease. *Sexual Transmitted Infection Journal* 108: 110-116
- Lossick, I.O. (1991). Treatment of sexually transmitted vaginosis. *Public Health L. Journal*. 76: 768-770
- Maefi, K. T., Khron M., and Hillier, S. (2016) Reliability of diagnosing bacterial vaginosis improved by standardized method of gram-stain interpretation. *Journal of Clinical Microbiology* 41: 57-65
- Menezes, K. (2016). An Outbreak of Sexual Transmitted Parasite Disease Investigation Report. *Journal of Microbiology* 20: 91-97
- Muelen, J., Maya, H.N., and Chang-Claude, J., (1992). Risk factors for HIV infection in gynaecological in-patients in DarEsSalaam. *Tanzania East Africa Medical Journal* 69: 688-692.
- Njoku, A.J. (2000). Treatment of Trichomoniasis. *Central African Journal of Medicine* 28; 7-10
- Paniker, C.K. (2002) *Textbook of Medical Parasitology* (5th edition) Rosenbel Publishers, London Pp 221-227
- Praise, W. B. (2014) Trichomonas vaginalis in and Bacterial vaginosis Co-existence in vaginal wet mount preparation from women. *Brazilian Journal of Medical and Biological Research* 56 : 101 114
- Soper G. F., Folman, M. B., and Cramer, T. C. (2009). Characteristic Asymptomatic males affected by trichomonas vaginalis in embryo transfer. *Journal of Reproduction and infertility*. 7:165-167.
- Ukoli, D. J., Principles and practice of Medicine. *Infectious disease Journal* 5: 2894-2898
- Wilson, K.L. (2001). Epidemiology of Trichomonas. *American Journal of Clinic Parasitology* 19:223-239
- World Health Organization (WHO). (2001). Global prevalence and incidence of selected curable sexually transmitted infections, Geneva, Switzerland. 223-249
- Weinstock, R., Romero, R., and Thomas, K. (2004). A review of Premature birth and subclinical infection. *AJMK Obstetric and Gynecology*. 92:1515-1528.
- Wolner, P., Krieger, J., and Stevens, G.E. (2000). *Clinical Manifestations of vaginal Trichomoniasis JAMA* 261:571-578