The Prevalence of *Trichomonas vaginalis* in Uyo Local Government Area of Akwa Ibom State, Nigeria

Imo U. Akpan *

*Department of Establishment, Akwa Ibom State University, Mkpat Enin.*

* Author to whom correspondence should be addressed; E-Mail: imoakaka4u@yahoo.com.

**Article history:** Received 23 July 2013, Received in revised form 30 August 2013, Accepted 8 September 2013, Published 25 September 2013.

**Abstract:** This study determined the prevalence of *Trichomonas vaginalis* among HIV-seropositive Nigerian in Uyo Local government area of Akwa Ibom State. The total of 150 HIV-seropositive women was studied using the mount preparations from high vaginal swab (HVS) and urine specimens. The highest prevalence of *T. vaginalis* infection (28.6) was recorded among individuals in the 41-45 years age category and the lowest (16.6) among the age categories 36-40 and above 55 years. However, a thorough medical examination and culture of HIV is highly recommended for pregnant women to ensure detection of vaginal infection by *T. vaginalis* among the immunosuppressed persons.

**Keywords:** *Trichomonas vaginalis*; prevalence; HIV; urine; Uyo; Nigeria.

1. **Introduction**

*Trichomonas vaginalis* is an obligate parasite, which cannot live without close association with the vaginal, urethral or prostatic tissues (Arora, 2005). Human trichomoniiasis is a widely prevalent sexually transmitted disease of worldwide importance. The incidence in normal population is approximately 100%. Asymptomatic infections have been observed in 50% of infected female patients.

The organism is responsible for a mild vaginitis with discharge. Vaginal discharge contains a large number of parasites and leucocytes and is liquid, greenish or yellow. It covers the mucosa down
to the urethral orifice, vestibular glands and clitoris (Ukoh, 1992). It usually has an oval or pear-like shape, but can assume an amoeboid form when attached to vaginal epithelial cells. T. vaginsalis has a total of five flagella, four of which are located at its anterior portion. The parasitic microorganism is the causative agent of trichomoniasis, and is the most common pathogenic protozoan infection of human in industrialized countries (Ukoh, 1992). Infection rates between men and women are the same with women showing symptoms while infections in men are usually asymptomatic. Transmission takes place directly because the trophozoite does not have a cyst. T. vaginalis is generally restricted to the genitourinary tract by the host’s immune system, and is the etiological agent of human trichomoniasis. Infection has been associated with an increased risk of human immunodeficiency syndrome in both sexes (Arora, 2009).

In women, symptoms of infection include vaginal secretion that is scanty and mixed with mucus; malodorous discharge that is frothy, yellow or green, mucopurulent, and copious. The protozoan can be found in the vagina, cervix, bladder, Bartholin’s, skene’s, and periurethra glands. Complications may result in cervical erosion, cervical cancer, infertility, adnexitis, pyosalpinx, and endometritis. Premature rupture of the placental membranes can occur in pregnant women, resulting in premature birth and low-birth weight. Acute infection is characterize by severe prutus, vaginitis, vulvitis with dysuria and dyspareunia, and hemorrhagic sports on the mucosa (Uneke, 2007).

The prevalence is lower in men, and infection is often asymptomatic. Infection in men can be present in the prostate, seminal vesicles, and epididymis. Complication are rare, but can potentially lead to genitourinary inflammation disease, sterility, scanty, clear to mucopurulent discharge, dysuria, non-gonococcal urethral disease, infection usually mild with no symptoms, thus making men potential carriers (Dauda, 2004). Spontaneous resolution of infection is common as the oxidative nature of the male genital tract is speculated to be inhibitory to pathogenic factors of infection, which usually remains for ten days or less.

Trichomonas vaginalis was first observed by Donne in 1836. Morphologically it resembles T.tenax. It measures 7-23 in length and 5-12 μm in width. The normal habitat of the parasite is human vagina, prostate, and urinary tract of both male and females. The parasite lives on the mucosa feeding on bacteria and leucocytes (Arora, 2009). The epidemiology of this disease has long been ignored, and not much is known about its natural history and risk factors.

Ukoli (1992) stated that the prevalence of the most virulent parasitic disease like ascariasis, taeniasis, schistosomiasis, hookworm disease, amoebiasis, onchocerciasis, giardiasis, etc. is still high in the tropical countries. He identified factors such as poverty, ignorance, hunger, and natural disaster like flooding as well as poor sanitation and personal hygiene as responsible for the high incidence of parasitic infections in tropical countries. The incidence of vaginal trichomoniasis has noticeably risen
especially in developing countries and in population with high-risk behaviors such as poor sexual activity hygiene and multiple sexual partners.

Scientific classification of *Trichomonas vaginalis* (Donne, 1836):

<table>
<thead>
<tr>
<th>Domain</th>
<th>Eukarya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phylum</td>
<td>Metamonada</td>
</tr>
<tr>
<td>Class</td>
<td>Parabasalia</td>
</tr>
<tr>
<td>Order</td>
<td>Trichomonadia</td>
</tr>
<tr>
<td>Genus</td>
<td>Trichomonas</td>
</tr>
<tr>
<td>Species</td>
<td><em>T. Vaginalis</em></td>
</tr>
</tbody>
</table>

Pathogenesis of Trichomoniasis: Although trichomoniasis is the most common non-viral sexually transmitted disease, the pathogenicity of *T. vaginalis* is not thoroughly understood. Trichomonads participate in a host-parasites relationship, causing them to adhere to epithelial cells. The ability of trichomonads to adhere is affected by time, temperature, and pH level. *T. vaginalis* grows best in an anaerobic environment with a pH 6.1 (Rook, 2007).

Binding of *T. vaginalis* to vaginal epithelial cells for colonization and infection is dependent upon specific parasite surface proteins. Parasites treated with tinidazole, metronidazole or other nitroimidazoles lose their ability to adhere, making them ineffective disease agents. Hemolysis, the destruction of red blood cells such that hemoglobin is released, is also corrected with virulence. Trichomoniasis has been seen to increase in severity during or slightly after menstruation.

The relationship between *T. vaginalis* growth and protective lactobacilli is a complex one it is currently unknown whether *T. vaginalis* infection alters the vaginal environment by creating an anaerobic situation, or if anaerobes in the vagina precede *T. vaginalis* growth. The vagina contains glycogen, and vaginal glycogen levels are elevated in woman of reproductive age. Glycogen is broken down into glucose, a nutrient *T. vaginalis* requires for growth (Ejezie, 1981).

Preventive measures of *T. vaginalis* are: (1) avoidance of sexual contact with person known to be infected with the STD, (2) the use of male and female condoms for every episode of sexual intercourse, which is recommended by the researchers, and (3) avoidance of high alcohol intake, which may increase the risk of sexual intercourse with multiple partners.

2. Materials and Methods

The study was conducted in Uyo, the Akwa Ibom State capital, south-south Nigeria. The University of Uyo Teaching Hospital (UUTH) that has the largest health institution in the state and a major referral centre for *T. vaginalis* screening and confirmation in Akwa Ibom, was used for the study.
Population of study/sampling technique: Female patients who were confirmed HIV-sero positive in Uyo, Akwa Ibom State capital, Nigeria.

A total of one hundred and fifty seropositive women of different ages and socioeconomic status attending HIV screening at University of Uyo Teaching Hospital, Uyo were enrolled in this study. The study was conducted over a period of seven months from February 2012.

Duplicate samples of high vaginal swabs were collected under aseptic condition using a speculum with the help of a gynecologist.

3. Results

One hundred and fifty HIV infected women were studied, and laboratory analysis indicated the presence of *T. vaginalis* in 42 (16.2%, 95% CI, 11.1-21.7%) of high vaginal swab (HVS) specimens and 37 (14.6%, 82% CI; 10.1-20.0%) of the urine specimen (Table 1). *T. vaginalis* was found in the HVS specimen of each individual whose urine sample had the parasite. *T. vaginalis* was not seen in the sample of three women who had the parasite in their HVS specimens. The highest infected (prevalence) of *T. vaginalis* infection (22.5%, 95% CI; 11.1-31.0%) was recorded among individual in the age 36-40 years age category, followed by those of age 41-45 years age group (19.3%, 82% CI; 10.2-38.2%). The lowest prevalence (10.7%) of *T. vaginalis* infection was observed among the women of age categories of 36-40 years (95% CI; 4.2-28.2%) and above 55 years (95% CI; 6.7-27.7%) as shown in Table 2. No significant difference (DF) in the association between *T. vaginalis* infection and age ($X^2 = 2.58$, DF$z2$, $P < 0.05$) was observed.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Number examined</th>
<th>Number of positive</th>
<th>Percentage of positive (%)</th>
<th>95% confidence interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVS</td>
<td>150</td>
<td>42</td>
<td>16.2</td>
<td>11.1-21.7</td>
</tr>
<tr>
<td>Urine</td>
<td>150</td>
<td>37</td>
<td>14.6</td>
<td>10.1-20.0</td>
</tr>
</tbody>
</table>

4. Discussion

*Trichomonas vaginalis* was detected in 16.2% of HVS and urine sample of HIV infected women patients. The study shows that the prevalence of *T. vaginalis* among HIV-seropositive Nigerian women using the wet mount preparation from high vaginal swab (HVS) in Uyo Akwa Ibom State Nigeria. This study is also inline with the study of Uneke et al. (2007) who reported 24.4% prevalence...
of *T. vaginalis* among HIV-seropositive Nigerian women using wet mount preparation from high vaginal swab (HVS). The study also reveals that *T. vaginalis* vaginal infection may be frequent occurrence among Nigerian women with HIV infection. The *T. vaginalis* infection was 16.2%. Observed in this study is significantly higher than among HIV-seropositive women in India (0.4-27.4%), Greece (4.6%), and Zaire (1.9%). Although the prevalence of *T. vaginalis* infection observed in this study may be considered relatively high, with the HIV specimens recording slightly higher rate than urine specimen, the possibility of underestimation of the prevalence may not be ruled out. The identification of this common treatable sexually transmitted infection offers a precious and mush needed additional strategy for AIDS prevention. However, the surest way to avoid transmission of sexually transmitted diseases is to abstain from sexual contact.

**Table 2.** Age-related prevalence of *T. vaginalis* infection and HIV seropositive women

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number examined</th>
<th>Number of positive</th>
<th>Percentage of positive (%)</th>
<th>95% confidence interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-40</td>
<td>22</td>
<td>4</td>
<td>16.6</td>
<td>4.3-32.3</td>
</tr>
<tr>
<td>41-45</td>
<td>31</td>
<td>09</td>
<td>28.6</td>
<td>18.0-45.0</td>
</tr>
<tr>
<td>46-50</td>
<td>42</td>
<td>12</td>
<td>28.4</td>
<td>17.1-40.2</td>
</tr>
<tr>
<td>50-55</td>
<td>25</td>
<td>11</td>
<td>19.3</td>
<td>10.0-29.9</td>
</tr>
<tr>
<td>&gt;55</td>
<td>29</td>
<td>6</td>
<td>16.6</td>
<td>6.6-28.8</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>42</td>
<td>16.2</td>
<td>6.7-27.7</td>
</tr>
</tbody>
</table>

In this study, age-related prevalence of *T. vaginalis* infection indicated the highest occurrence among the HIV-infected women of 41-50 years old which is inline with the observation made in a similar study in California, USA.

The presence of *T. vaginalis* among HIV infected women in Uyo, the Akwa Ibom State capital has public health implications for HIV as it confirms the practice of unprotected sex, and the use of condom is advised as well as family planning. The need for providing proper counseling and education or sexual behavior and genital hygiene more so, treatment to control and prevent these infections is advocated since HIV and *T. vaginalis* spread as sexually transmitted disease. The use of well tolerated antibiotic should be taken.

**5. Conclusions**

The advents of non-invasive testing for STDS using amplification technology should facilitate prospective, age structured epidemiological studies of *T. vaginalis* in the community, which will be
useful in helping to shape future control programs. Diagnostic tests will probably remain expensive and hyperendemicity of the disease in many populations raises the possibility of instituting widespread treatment of all women regardless of symptoms, signs, or laboratory investigations. Since HIV and *T. vaginalis* are primarily spread as sexually transmissible diseases, the educational efforts must be aimed at sexually active persons and high risk groups and must be explicit regarding the behaviors that lead to the spread of both HIV and *T. Vaginalis*.

**Acknowledgement**

I thank the management and staffs of the University of Uyo Teaching Hospital for their cooperation, permission during this study, and the staffs of the Department of Microbiology and Parasitology for permitting the use of their laboratory for bacteriological analysis. Finally I am grateful to Miss Imaobong James and Akaninyene Akaka for their encouragements.

**References**


