Short Communication

Frequency of Human Immunodeficiency Virus (HIV) in *Trichomonas vaginalis* Infected Women in Badagry, Lagos, Nigeria

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Abstract

Background: The interaction between HIV and *Trichomonas vaginalis* infection has been widely studied in most developed countries but with scanty information in sub-Saharan Africa. While many of these studies have examined the prevalence of *T. vaginalis* infection in HIV positive individuals, no study in Nigeria has shown the effect of *T. vaginalis* on HIV transmission. Therefore, the study aimed to determine the occurrence of HIV in *T. vaginalis* infected women.

Methods: A descriptive study was conducted among women attending STI clinic at the General Hospital, Badagry, Lagos, Nigeria. A total number of 201 (*T. vaginalis* infected) women were screened for HIV using rapid diagnostic test kits.

Results: The frequency of HIV in *T. vaginalis* infected women was 35.8%.

Conclusion: The study showed that *T. vaginalis* infection in women may be a high risk factor of HIV infection.

Keywords: HIV transmission, Nigeria, Severity, *Trichomonas vaginalis*.
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Introduction

One of the approaches towards aggressive human immunodeficiency virus (HIV) transmission prevention is the identification and targeting of persons who may be more likely to transmit HIV infection (1). One of such groups is individuals with concurrent infection of HIV and sexually transmitted infections. The risk of HIV transmission to an uninfected partner becomes higher in an HIV-positive person with concurrent sexually transmitted diseases (STDs) (2, 3).

Trichomonas vaginalis is one the most prevalent nonviral sexually transmitted pathogens with an estimate of 170 million new infections per year (4). Several signs and symptoms have been associated with *T. vaginalis* infections which include vulvovaginal soreness or irritation, vaginal discharge, dysuria and dyspareunia (5). Despite these and many other morbidities associated with trichomoniasis, there has been neglect in terms of intensive study and active control programs in the sub-Saharan Africa; the neglect is often linked to a relatively mild nature of the disease (6). Evidences, however, have shown the amplifying potential of *T. vaginalis* on HIV transmission in sub-Saharan Africa (7, 8). Despite this great potential of *T. vaginalis* in the transmission dynamics of HIV, there has been no information on the prevalence of HIV in *Trichomonas* infected individuals in Nigeria. However, few data have shown the opposite trend. Therefore, the occurrence of HIV infection was investigated in a cohort of *T. vaginalis* infected women attending STI clinic at the General Hospital Badagry, Lagos.

Methods

The study was conducted in Badagry, a coastal town and Local Government Area in Lagos State, southwestern Nigeria. Badagry is a highly commercialized community with numerous recreational centers. Oftentimes, many sex workers are seen clustering around these centers awaiting potential customers.

The study was descriptive with only women who gave informed consent included in the study. The

study included 201 women (14-52 years) that presented themselves to the STD outpatient clinic at General Hospital in Badagry and *T. vaginalis* was detected in all of them. The sample size was determined by the method of Daniel (9). The HIV status of the women was determined using standard method.

High vaginal swab (HVS) samples were collected aseptically with sterile cotton wool. A drop of physiological normal saline was added to a fresh wet smear made on a clean glass slide. With the slide covered by a cover slip, it was examined microscopically for the quick jerky motion of *T. vaginalis* (10). The severity of *T. vaginalis* infection was categorized as light, moderate and heavy when parasite counts ranged between 1-9, 10-49 and ≥50, respectively.

HIV screening was determined by rapid test kits-Stat Pak HIV 1/2 (manufacturer- ChemBio Diagnostic Systems Inc. New York, USA), Determine, Uni-Gold™ (manufacturer- Trinity Biotech Plc, Ireland) and double gold. Tests were carried out on blood obtained from finger-prick according to manufacturer's instructions. Prevalence of HIV infection was then determined among the subjects. Reference test serving as the control was obtained from the hospital central laboratory to determine the rapid test diagnostic accuracy.

All the women who volunteered to participate and were positive for *T. vaginalis* infection besides those who delivered written informed consent were included. The protocol for the study was reviewed and approved by the hospital management and Ethical Review Committee of Olabisi Onabajo University Teaching Hospital.

Results

Of the 201 *T. vaginalis* infected women, 72 (35.8%) were positive for HIV infection. A total of 56 (33.3%) were HIV positive and were placed in the light *T. vaginalis* infection category while 15 (46.9%) and 100% HIV prevalence level were recorded in the moderate and heavy *Trichomonas* infection status, respectively (Figure 1).

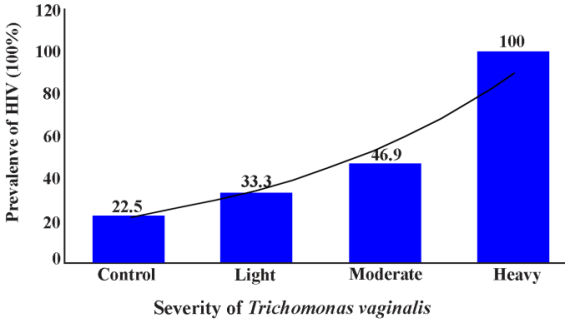

Figure 1. HIV infection in relation to *T. vaginalis* severity

Discussion

This study showed a high prevalence of HIV among pregnant women with concurrent *T. vaginalis* infection. The usual HIV prevalence levels in Ogun state and other parts of Nigeria ranged between 3.1-17.5% among women (11-13). This range has been generally found to be lower than HIV status in concurrent infection with other related sexually transmitted infections. Trichomoniasis is one of the most common STDs often linked to HIV infections. Our observation is similar to other studies that reported associations between trichomoniasis and HIV (14, 15). The association between trichomoniasis and increasing risk of HIV acquisition has been biologically linked to *T. vaginalis* induced inflammatory response with recruitment of CD4-bearing lymphocytes and macrophages to the vaginal and cervical mucosa (16). *Trichomonas vaginalis* has been shown to degrade secretory leukocyte protease inhibitor, which can block HIV-1 adherence to cells (17). It can also increase the risk of HIV-1 infection by increasing susceptibility to bacterial vaginosis (18).

Although no significant difference was observed in HIV prevalence level in different *T. vaginalis* severity levels, the risk of acquiring HIV increases with the increase in *T. vaginalis* burden. The high prevalence of HIV generally observed in all age groups is expected as all participants are sexually active groups. With such high prevalence level, preventive health measures in form of public enlightenment on the transmission of STDs should be channeled towards all women in their reproductive ages.

This study showed that *T. vaginalis* infection increased the risk of HIV-1 acquisition and therefore HIV transmission can be reduced by targeting intervention against trichomoniasis. This approach can be incorporated into the prenatal and the antenatal clinics in order to capture wider community coverage.

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Conflict of interest

Authors have no conflict of interest.

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