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 pre-

sented themselves to the STD outpatient clinic at

General Hospital in Badagry and T. vaginalis was
detected in all of them. The sample size was de-
termined by the method of Daniel (9). The HIV
status of the women was determined using stand-
ard method.

High vaginal swab (HVS) samples were collect-
ed 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 infec-
tion 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 Diag-
nostic 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 be-
sides those who delivered written informed con-
sent were included. The protocol for the study was
reviewed and approved by the hospital manage-
ment 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).

**Discussion**

This study showed a high prevalence of HIV
among pregnant women with concurrent T. vagi-
nalis 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 re-

lated sexually transmitted infections. Trichomo-
niasis is one of the most common STDs often
linked to HIV infections. Our observation is simi-
lar to other studies that reported associations be-
tween trichomoniasis and HIV (14, 15). The asso-
ciation 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 mac-
rophages 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 increas-
es with the increase in T. vaginalis burden. The
high prevalence of HIV generally observed in all
age groups is expected as all participants are sex-
ually active groups. With such high prevalence
level, preventive health measures in form of pub-
lic enlightenment on the transmission of STDs
should be channeled towards all women in their
reproductive ages.

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

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**Conflict of interest**

Authors have no conflict of interest.
References