

# PREVALENCE OF HIV AMONG WOMEN WITH VAGINAL DISCHARGE IN A GYNECOLOGICAL CLINIC

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**Objective:** Vaginal discharge is a common complaint among women with sexually transmitted diseases (STDs) in Nigeria. Given the association between STDs and HIV and the alarming rise in the prevalence of HIV in Nigeria, we performed this study to determine the prevalence of HIV in patients with vaginal discharge.

**Study Design:** Between April 2000 and August 2000, women who attended the Lagos University Teaching Hospital and complained of vaginal discharge were adequately counseled for HIV serotest. High vaginal/endocervical swabs and venous blood were taken for microbiological studies and HIV serotest, respectively.

**Results:** Out of the 230 women counseled for HIV serotest 140 (60.9%) consented. The mean age of the 140 was 31.1±6.9 years (range 18–50 years). In 31 (22.1%), *Candida albicans* was isolated, in 26 *Gardnerella vaginalis* (18.8%), in 17 *Staphylococcal spp.* (12.1%); and *E. coli*, *Trichomonas vaginalis*, and *Neisseria gonococcus* in 7.9%, 4.3%, and 1.4%, respectively. Four (2.9%) of the 140 patients were HIV seropositive, and all had *Candida albicans* isolated. The prevalence of HIV among patients with *Candida albicans* was 12.9%. Association between HIV seropositivity and *Candida albicans* infection is significant ( $X^2=14.48$ ;  $p=0.002$ ).

**Conclusion:** *Candida albicans* is a common cause of vaginal discharge among HIV-seropositive women in Lagos. (*J Natl Med Assoc.* 2004;96:367–371.)

**Key words:** vaginal discharge ♦ HIV

## INTRODUCTION

Vaginal discharge, which may be physiological or pathological, is a common gynecologic complaint worldwide. Vaginal discharge may also be a symptom or sign a serious disease of the genital tract. In Lagos, Nigeria, it is the most common pre-

senting complaint in gynecological and antenatal clinics.<sup>1</sup> It is also the most common presenting symptom in females with sexually transmitted diseases (STDs) in Nigeria.<sup>2</sup> Numerous epidemiologic and biologic studies have shown that STDs, whether ulcerative or nonulcerative, may be associated with increased HIV acquisition and transmission.<sup>3-5</sup> People who have sexually transmitted infections (STIs) are two-to-five times more likely to become infected with HIV.<sup>3</sup> Some of the possible mechanisms responsible for this include: 1) STD pathogens could disrupt the mucosal tissues and/or increase the number of cells receptive to HIV-1 and/or increase the number of receptors expressed per cell<sup>6</sup>; 2) endocervical inflammation caused by nonulcerative STDs increases shedding of HIV-

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infected cells, and this probably increases infectivity<sup>6,7</sup>; 3) nonulcerative STDs may facilitate HIV acquisition by increasing CD4 lymphocytes and interleukin (IL)-10 in the endocervix.<sup>7-9</sup> In vitro studies have shown that CD4 lymphocyte molecule and chemokines are necessary to permit HIV-1 entry into host cells.<sup>10</sup> Chemokines could also be expected to increase replication of HIV-1 and/or increase the number of HIV receptive cells.<sup>6</sup> The high prevalence of vaginal discharge, a high proportion of which is due to STDs among attendees of gynecological clinics in Nigeria, calls for more studies on this subject.<sup>1,11</sup> Given the association between STDs and HIV and the alarming rise in the prevalence of HIV in Nigeria, we performed this study to determine the prevalence of HIV in patients with vaginal discharge. We hypothesized that the prevalence of HIV among patients with vaginal discharge in Lagos state was higher than the state's overall HIV prevalence rate of 6.7%.

## MATERIALS AND METHODS

The study was carried out between April 2000 and August 2000 in the Cervical Cytology Clinic of the Lagos University Teaching Hospital. The clinic also takes care of patients from the gynecologic and family planning clinics who complain of vaginal discharge. The patients for the study were women in the reproductive age (15–49 years) that came to the clinic complaining of vaginal discharge. Pregnant

women, postmenopausal women, and those with obvious benign or malignant lesions of the cervix were excluded from the study, which was approved by the Ethics and Research Committee of the Lagos University Teaching Hospital.

Consecutive patients attending the clinic who complained of vaginal discharge were informed individually about the purpose of the study, and those who consented to participate were adequately counseled on HIV serotest. Adequate arrangements were made for those who tested positive to have further laboratory tests, counseling, and treatment at the Nigeria Institute of Medical Research. The institute provides antiretroviral drugs, which are heavily subsidized by the Federal Government of Nigeria at a very affordable price.

Each of the participants was put in a dorsal position and after swabbing the vulva anterior-posteriorly with a sterile, absorbent cotton wool swab, an unlubricated sterile Cusco speculum was passed. A high vaginal swab (HVS) and endocervical swabs (ECS) were taken for microbiological studies. The appearance and the odor of the discharge were noted, and the pH was estimated using a litmus paper with pH range 4–10. Amine test was done by dropping two drops of 10% KOH on the discharge in the well of the blades of the Cusco's speculum. The ECS was immediately plated on chocolate agar plate and incubated in CO<sub>2</sub> at 37°C for 24–48 hours.

Gram staining was quickly done on the specimen

**Table 1. Causative Organisms Identified in Vaginal Discharge**

Organism	Frequency	Percentage
<i>Gardnerella vaginalis</i>	26	18.6
<i>Neisseria gonococcus</i>	2	1.4
<i>Trichomonas vaginalis</i>	6	4.3
<i>Gardnerella + candida</i>	4	2.9
<i>Staphylococcal spp.</i>	17	12.1
<i>E. coli</i>	11	7.9
Others	6	4.3
<i>Candida spp.</i>	31	22.1
Nil isolate	40	28.6
<b>Total</b>	<b>*145</b>	

\*Some patients had more than one type of infection.

and examined for pus cells, yeast cells, and gram-negative intracellular organisms. The HVS was plated and cultured in blood agar and incubated aerobically at 37°C for 24–48 hours. A wet preparation was done for trichomonas vaginalis and gram staining for pus cells, yeast cells and aerobic organisms. Blood was taken for HIV serology, which was done at the Nigerian Institute of Medical Research, Lagos. HIV screening was by ELISA technique and confirmed by the Western blot technique. A questionnaire to collect information on age, marital status, parity, sexual partner, and occupation was applied to each patient.

Data analysis was done using Epi Info version 6.04. Proportions were compared using the chi-square. A p value of <0.05 was considered significant.

## RESULTS

Two-hundred-thirty patients were informed about the purpose of the study, and 90 (39.1%) refused to be included in the study. A total of 140 women were therefore studied. The mean age was 31.1±6.9 years (range 18–50 years) with the majority (83.0%) in the 20–39-year age group. The mean parity was 1.76±2.1 (range 0–8), and more than one-third (39.3%) were nulliparous. One-hundred-fourteen (81.4%) of the patients were married, and 25 (18.9%) were single. Nine (6.4%) of the 140 patients gave a history of having more than one sexual partner. Table 1 shows the prevalence of the various isolates identified in the vaginal discharge of the 140 patients studied. In 31 patients (22.1%), *Candida spp.* (predominantly *Candida albicans*) were isolated. This was followed by *Gardnerella vaginalis*, 26 (18.8%). *Staphylococcal spp.* were isolated in 17 (12.1%). *E. coli*, *Trichomonas vaginalis*, and *Neisseria gonococcus* were in 7.9%, 4.3%, and 1.4%, respectively. In 40 (28.6%), no organisms were isolated. Four of the 140 patients were HIV seropositive, giving an HIV-seroprevalence rate of 2.9%. Table 2 shows the sociodemographic characteristics of the patients who were

HIV seropositive. All the four of them were married. The mean age was 36.8±5.2 years (range 29–40 years) with a mean parity of 3.3±1.7 (range 1–5). All of them were petty traders. They were all sexually active, one of them admitting to having three sexual partners at a time. Their vaginal discharge was thick and white in color; nonoffensive and *Candida albicans* organism was isolated in all of them. They all had pruritus vulvae. Four of 31 patients (12.9%) with candidiasis were HIV positive, while none of the 109 women without candidiasis were HIV positive. This was statistically significant (p=0.002).

## DISCUSSION

Persons with HIV infection who subsequently develop an acute STD have an increased probability of transmitting HIV, as persons with acute STDs have increased probability of acquiring HIV.<sup>3</sup> STDs, therefore, play an important role in the transmission of HIV. Its prevention, thus, becomes important in the prevention of HIV.

In this study, 2.9% of patients with vaginal discharge were HIV positive. This is far lower than the prevalence rate of 6.7% in Lagos and the national prevalence rate of 5.4%.<sup>12</sup> The reasons for this may be because we sought the consent of the patients before performing the HIV serotest. It may be possible that those patients who strongly believed that they could have HIV were not brave enough to accept getting the test. Perhaps if we had done anonymous testing, we would have had a higher prevalence rate. The rates found in the last sentinel survey in Nigeria<sup>12</sup> were obtained by anonymous testing. Secondly, the study was hospital-based, which was not quite a true representation of the population; a community-based study may have perhaps shown a higher prevalence. These reasons notwithstanding, a prevalence rate of 2.9% could still be considered as being high.

All the four patients who were HIV seropositive were married and had children. This is not surpris-

Table 2. Characteristics of Patients With HIV Positivity

Age (Years)	Marital Status	Parity	Occupation	Vaginal Infection
39	Married	1	Trading	<i>Candida</i>
29	Married	4	Trading	<i>Candida</i>
39	Married	5	Trading	<i>Candida</i>
40	Married	3	Trading	<i>Candida</i>

ing, as it is well-documented that heterosexual transmission is the predominant mode of spread of HIV in sub-Saharan Africa. All the patients who were HIV seropositive were petty traders, usually of very low income. Even though only one of them admitted to having more than one sexual partner, it would not be incorrect to speculate that extramarital affairs to raise money to supplement income is particularly rife among petty traders.

*Candida albicans* was found in all the HIV seropositive patients. This organism is one of the common organisms that causes vaginal discharge among Nigerian women.<sup>1,11</sup> It was also the most common organism found in the patients in our study. Recently, it was reported that women infected with HIV were more likely to have prevalent vulvovaginal candidiasis (OR 1.8 CI 1.0–3.25  $p=0.05$ ), and the annual incidence rate was 4%.<sup>13</sup> It is therefore not surprising that in our study, *Candida albicans* was the common organism found in the HIV-positive women. Other studies have also confirmed that immunocompromised HIV-1 infected women are known to have increased rates of vaginal candidiasis.<sup>13,14</sup> *Candida albicans* often infects the vaginal mucosa when there is no significant reduction in CD4 lymphocyte count.<sup>15</sup> Thus, vulvovaginal candidiasis, unlike oropharyngeal and oesophageal candidiasis that are associated with significant reduction in CD4 lymphocytes counts (CD4 below  $0.1 \times 10^4/L$  in oesophageal candidiasis), often occurs early in the course of HIV infection.<sup>15</sup> In one study, chronic candidiasis was the presenting complaint in 24% of HIV infected females.<sup>16</sup> Another study found 64 (35%) of 184 HIV-seropositive women to have vaginal swabs positive for yeast.<sup>17</sup>

Going by these reports, it is possible that the women in our study may have acquired HIV infection before developing the vulvovaginal candidiasis and that they might have been in the early stage of the infection. Vaginal candidiasis is reported to be associated with a significant increase in HIV-1 shedding by cells of the vagina.<sup>13</sup> It may therefore increase the infectivity of an HIV-seropositive woman. This would mean treating an HIV-positive woman with vulvovaginal candidiasis would decrease transmission of the virus to her sexual partners and even to future children. Also treating women who have vulvovaginal candidiasis may reduce their chances of acquiring HIV infection. This is worthy of note especially here in Nigeria, where candidiasis is a common cause of vaginal discharge and HIV infection has reached epidemic

levels with the prevalence rising exponentially.

Other conditions that cause vaginal discharge—like bacterial vaginosis, trichomoniasis, gonococcal, and chlamydia cervicitis—have been found in different studies to be more common in HIV-seropositive women.<sup>4,13,18</sup> We were not able to demonstrate this in our study, possibly because the number we studied was small. Also the prevalence of some of the organisms in our study population were too small for us to make any meaningful deductions. We hope to carry out a community-based study on this subject in the nearest future.

The predominance of *Candida albicans* infection in HIV patients in our study infers that patients with vulvovaginal candidiasis, especially those with chronic cases, may need to be counseled for HIV screening. This may help in the early diagnosis of the disease so that appropriate interventions could be taken to prevent early progress into AIDS. More importantly, it may prevent spread to partners and to future children and, thus, help reduce the prevalence of the disease in the society at large. As the voluntary testing for HIV in Nigeria is only 16.5%,<sup>19</sup> we hope that the result of this study may help in persuading patients with pathologic vaginal discharge to have voluntary testing for HIV.

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