

Sero-Prevalence of HIV Infection Among Commercial Sex Workers in Ibadan, Nigeria.

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Abstract

Context: Commercial sex workers (CSWs) are an important group for the transmission of human immunodeficiency virus (HIV) infection all over the world. In view of the upsurge in the prevalence of HIV in Nigeria, it is desirable to determine the magnitude of their contribution to the problem and how to incorporate them into control efforts.

Objective: The main objective of this study was to determine the sero-prevalence of HIV infection among commercial sex workers (CSWs) in Ibadan, Nigeria.

Study Design: This was a cross-sectional survey involving 169 CSWs that were randomly selected from 18 brothels in Ibadan and 136 other women without HIV-related symptoms who visited the Special Treatment Clinic, University College Hospital Ibadan who served as the control group.

Results: Of the 169 CSWs investigated, 58 (34.3%) had HIV infection whilst only 3 (2.2%) of the control subjects were seropositive for HIV, a highly statistically significant difference ($p < 0.000001$). Vaginal candidiasis was the most common STD diagnosed in both CSWs and the control subjects. All the 13 CSWs that had scabies, 4 (36.4%) of those with genital warts and 19 (67.9%) of those with genital ulcers had HIV infection. Apart from HIV infection, the only condition that was markedly more prevalent among the CSWs was genital ulcer (16.6% vs 1.5%; $p < 0.0001$).

Conclusion: These findings indicate a high seroprevalence of HIV among CSWs in Ibadan and the need to direct efforts to prevent them from spreading it further in the population.

Key Words: HIV, Seroprevalence, Commercial Sex Workers. [Trop J Obstet Gynaecol, 2003, 20: 12-15]

Introduction

Sexually transmitted diseases (STDs) constitute a major public health problem worldwide especially in the developing countries^{1,2} a situation that has been compounded by non-availability of reliable data on the prevalence and pattern of these infections for the planning control strategies^{1,3}.

The arrival on the scene of the human immunodeficiency virus (HIV), which is a sexually transmitted infection in about 80 percent of cases^{4,5}, has worsened the situation. While the other STDs such as gonorrhoea and syphilis are treatable, HIV, and the acquired immune deficiency syndrome (AIDS) associated with it, is invariably fatal. Several factors have allowed for the rapid spread of HIV in sub-Saharan Africa. The urbanisation of Africa with the subsequent disruption of the traditional family unit has led to an increase in commercial sex work, a known reservoir for HIV in Africa³. Moreover, modernisation of Africa has led to increased mobility with the development of better and more accessible transportation. Similarly, deteriorating health care in certain areas, political changes and war have all contributed to the growth of the epidemic.

Commercial sex workers (CSWs) are an important reservoir for the transmission of a number of STDs, including HIV infection, all over the world^{6,7}. There

are at present no comprehensive or reliable data on the prevalence of STDs especially HIV infection among CSWs in Nigeria. Evidence from studies in other countries however shows this to be high^{6,8}. Early in the evolution of the epidemic, the seroprevalence among commercial sex workers (CSWs) in Nairobi, Kenya increased from 4 to 61% in only 4 years while in one particular group of high-risk CSWs, the HIV-1 seroprevalence rate reached 90%⁹. The HIV-1 seroprevalence rate was 59% among 1209 female sex workers in Abidjan, Cote d'Ivoire¹⁰. It has also been reasonably established that the presence of STDs in a person is associated with an increased risk of HIV infection following exposure, by a factor of 3 to 5, and can be as high as 300-fold in the presence of a genital ulcer^{11,12,13}. Among men presenting with genital ulcer disease in Nairobi, 23% were reported to be HIV-1 seropositive¹⁴.

The multiple partners of commercial sex workers make them vulnerable to STDs including genital ulcer syndromes, which in turn increases the risk of HIV infection. The aim of the present study was to determine the seroprevalence of HIV among the commercial sex workers in Ibadan, Nigeria.

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Subjects and Methods

Commercial sex workers (CSWs) working in 18 brothels that were randomly selected in Ibadan municipality were included in this study, which was done between February 1998 and March 2000. The investigators and the public health-nursing officers attached to the Special Treatment Clinic (STC) of the University College Hospital Ibadan contacted the Directors of the brothels and the "Presidents" of the inmates to enlist their support in recruiting the subjects. Female patients attending the STC and having no symptoms suggestive of HIV/AIDS during the period of study were randomly selected and served as controls.

The name, age, place of work, other occupation, parity, and marital status were recorded. Symptoms of dysuria, low abdominal pain, and vaginal discharge were routinely enquired after. All the CSWs and Controls had a complete pelvic examination. Specimens for culture were taken with sterile cotton-tipped applicator from the urethral, vagina and endocervix.

Laboratory Procedures

The cervical and urethral swabs were Gram-stained for intra-cellular Gram-negative diplococci, and cultured onto Modified Thayer-Martin's medium. The plates were incubated at 37°C in an atmosphere of a candle extinction jar. Suspected oxidase-positive colonies were Gram-stained for Gram-negative diplococci and confirmation by sugar utilization tests in serum-free medium¹⁵. Beta-lactamase activity of the isolates was tested using the starch-paper technique¹⁶.

Screening for *Trichomonas Vaginalis*

The high vaginal swabs were examined for the presence of *Trichomonas vaginalis* by agitating the cotton swab in 1 ml of saline in a test tube and a drop of the resulting suspension transferred to a microscope slide which was covered with a cover slip and then examined at x 100 and x 400 magnification. The swabs were also examined for *Candida albicans*, *Gardnerella vaginalis* (Clue cells) and other microbes. Culture for *T. vaginalis* was performed using nutrient broth glucose serum medium¹⁷. Examination for growth of *T. vaginalis* was made at 48 hours and 5 days after starting incubation, by making a wet mount of sediment from the bottom of the Bijou bottles containing the medium and searching for motile *T. vaginalis*.

Screening for HIV

Blood samples were taken and tested for HIV antibodies using a commercially available enzyme-linked immunosorbent assay (ELISA) and a Western

blot (WB) assay using the procedures recommended by the manufacturers. The sera were also used for VDRL and TPHA tests.

Statistical Analysis

The means and standard deviation (SD) were calculated for the continuous variables and the *t*-test was used to determine statistically significant differences. The chi square test was used to compare categorical variables.

Results

During the period of study, 169 Commercial sex workers (CSWs) from 18 brothels and 136 female patients without AIDS-related clinical features were investigated for HIV infection at the STC. Fifty-eight (34.3%) of the 169 CSWs investigated were seropositive for HIV infection compared to only 3 (2.2%) of the control subjects, a highly significant difference ($\chi^2 = 68.4$, $df = 1$; $p < 0.0000001$). Vaginal candidiasis was the commonest STD diagnosed in both the CSWs and the controls. The prevalence of the other STDs detected in both groups is shown in Table 1.

Table 1

Prevalence of STDs in Study Participants

STD	CSWs n (%) N = 169	Controls n (%) N = 136
<i>Gonorrhoea</i>	28 (16.6)	21 (15.4)
<i>Candidiasis</i>	99 (58.6)	70 (51.4)
<i>Trichomoniasis</i>	37 (21.9)	26 (19.1)
<i>Genital Warts</i>	11 (6.5)	3 (2.2)
<i>Non-specific Vaginitis</i>	42 (24.9)	12 (8.8)
<i>Scabies</i>	13 (7.7)	0 (0)*
<i>'Genital Ulcer'</i>	28 (16.6)	2 (1.5)*
<i>Tinea Cruris</i>	32 (18.9)	13 (9.6)
<i>Syphilis (TPHA)</i>	7 (4.1)	0 (0)
<i>HIV</i>	58 (34.3)	3 (2.2)*

* Statistically Significant Difference

Genital ulcers ($\chi^2 = 19.33$; $df = 1$; $p < 0.0001$) and scabies ($\chi^2 = 10.93$; $df = 1$; $p < 0.001$) were more likely to be found among the CSWs than in the female STD Clinic population.

All the 13 CSWs that had scabies, 4 (36.4%) of the 11 with genital warts and 19 (67.9%) of the 28 diagnosed with "genital ulcers" were all seropositive

for HIV. The beta-lactamase producing strains constituted 97.6% of the gonococcal isolates.

The age distribution of the CSWs and the controls were similar with those aged 20 to 29 years being 63.3% and 58.1% in the two groups respectively. Only 4.2% of the CSWs and 5.1% of controls were over 50 years of age. The majority of the CSWs (126 or 74.5%) were Para 1 or less compared to 52 (38.2%) of the controls. At the other end of the parity spectrum, only 3 (1.8%) of the CSWs were Para 4 or more compared to 17 (12.5%) of the controls. Of the 169 CSWs seen, 88 (52.1%) were single, 37 (21.8%) separated, 28 (16.6%) divorced and 10 (5.9%) widowed. Only 6 (3.6%) were married and these were not living in the brothels. In the control group, 63 (43.6%) were single, 32 (23.5%) were married and 38 (28%) were either separated or divorced. None of these socio-demographic characteristics correlated significantly with HIV status. All the CSWs investigated admitted to regular use of prophylactic antibiotherapy in various combinations, the commonest being weekly spectinomycin injection.

Discussion

Infection with HIV is now pandemic¹⁸ and the clinical disease, AIDS, is the latest addition to the list of STDs, occurring all over the world especially tropical Africa¹⁹. Like no other STD before it, it has become a huge public health problem in both developed and developing countries²⁰. Prevalence of STDs including HIV infection is rising²¹ and women, particularly CSWs, are a significant factor in transmission, as reservoirs and sufferers^{22,23}.

A considerable number of unmarried, unemployed women engaging in commercial sex work live comfortably in many brothels scattered around the municipality of Ibadan, catering for the sexual needs of men who pay cash in exchange for sex²⁴. The gender distribution of HIV infection in many parts of Africa has been found to vary with age^{25,26}. Most of the CSWs encountered during the study were young, with about three quarters being below 30 years. This is not unexpected, as there is usually a higher demand for younger women by men who patronise brothels. This is in keeping with the findings reported by other researchers in Nigeria and elsewhere^{24,27}.

The spectrum of STDs among the CSWs has widened since the previous study done here in 1972 by Osoba²⁸. While gonorrhoea and trichomoniasis were the only STDs diagnosed among other women, the spectrum of STDs among the CSWs investigated

then was wider. That spectrum has widened further now to include HIV that is twelve times more prevalent among CSWs than in a female STD clinic population.

It has been reasonably established that the presence of STDs increases the risk of contracting HIV infection^{18,29,30}. Sexually transmitted diseases may increase susceptibility to infection by causing genital lesions that facilitate viral entry or by increasing the number of target cells for HIV. It is associated with an increased risk of HIV infection following exposure by a factor of three to five and can be as high as 10-300 folds in the presence of a genital ulcer which has been identified as a risk factor in Africa⁴. In studies conducted in African STD clinics, these ulcers were often caused by *Haemophilus ducreyi* (chancroid) but syphilis and genital herpes have also been reported as possible cofactors for infectivity³¹. In one African study, both *Chlamydia trachomatis* infection and the presence of genital ulcer were risk factors for HIV infection and were independently significant in a multivariate analysis³⁰. Since these CSWs often have other STDs, it is not surprising that they have such a high prevalence of HIV infection. Increased viraemia in the infected partner resulting from an STD may also be an important cofactor for sexual transmission.

We found no significant difference in the prevalence of vulvo-vaginal candidiasis, gonorrhoea and trichomoniasis between the CSWs and the control group. The implication of this is that the role of CSWs as vectors of STDs, other than HIV, has gradually declined in importance compared to the situation 30 years ago²⁸.

The social, economic and the medical consequences of HIV are already being felt in many areas of the world. AIDS has become the leading cause of death for both men and women aged 15 to 49 in many parts of sub-Saharan Africa. Hence, public health workers interacting with CSWs and others involved in commercial sex work should stress techniques that can help prevent the spread of STDs such as the use of condoms. Control can best be accomplished by public health programmes that are committed to finding STD transmitters through persistent efforts to screen, diagnose, treat, and follow-up high-risk individuals within communities. Women who exchange sexual favours for money are particularly at risk and can no longer be ignored. They should be identified and made to participate in prevention and control programmes for all sexually transmitted infections⁷.

References

1. Osoba, AO. Sexually transmitted diseases in tropical Africa: a review of the recent situation. *Br J Vener Dis*, 1981; 57: 89-94.
2. Atili VR, Meheus A. Sexually transmitted diseases in Zambia: simplified control strategy in primary health care services. *Med J Zambia*, 1983; 17: 18-22
3. Ekweozor CC, Olaleye OD, Tomori O, Saliu I, Essien EM. Sexually transmitted diseases in Ibadan in the 1990's: HIV infection - an additional dimension. *Afr J Med med Sci*, 1994; 23: 363-367.
4. Adler M, Foster S, Richens J, Slavin H. Sexual health and care: sexually transmitted infections. guidelines for prevention and treatment. *ODA Health and Population Occasional Paper London*, 1996; 10-17.
5. WHO GPA. Consensus statement from consultation on sexually transmitted diseases as a risk factor for HIV transmission. Geneva, 4-6 January, 1989. NF/89. 1: 1-4.
6. Tanyuksel M, Gun H, Doganci L. Prevalence of *Trichomonas vaginalis* in prostitutes in Turkey. *Centr Eur J Pub Health*, 1996; 4: 96-97.
7. Potterat JJ, Rothenberg R, Bross DC. Gonorrhoea in n street prostitutes: epidemiologic and legal implications. *Sex Transm Dis*, 1979; 6: 58-63.
8. Pal NK, Chakraborty MS, Das A, Khodkevich L, Jana S, Chakraborty AK. Community based survey of STD/HIV among commercial sex workers in Calcutta (India). Part IV: sexually transmitted diseases and related risk factors. *J Communic Dis*, 1994; 26: 197-202.
9. Piot P, Plummer FA, Rey MA *et al*. Retrospective sero-epidemiology of AIDS virus infection in Nairobi populations. *J Infect Dis*, 1987; 155: 1108-1112.
10. Ghys, PD, Diallo MO, Ettiegne-Traore V *et al*. Dual seroactivity to HIV-1 and HIV-2 in the female sex workers in Abidjan, Cote d'Ivoire. *AIDS*, 1995; 9: 955-958.
11. Umar SU. Knowledge, attitude, preventive practices and treatment seeking behaviour regarding sexually transmitted diseases among commercial sex workers in Ibadan. A dissertation submitted in partial fulfillment of the requirement for the degree of Master of Public Health, University of Ibadan, 1998.
12. Peterman TA, Curran JW. Sexual transmission of human immunodeficiency virus. *JAMA*, 1986; 256: 2222-2226.
13. Aral, SO, Holmes KK. Sexually transmitted disease in the AIDS era. *Sci Am*, 1991; 264: 62-69.
14. Tyndall MW, Ronald AR, Agoki E *et al*. Increased risk of infection with human immunodeficiency virus type 1 among uncircumcised men presenting with genital ulcer disease in Kenya. *Clin Infect Dis*, 1996; 23: 449-53.
15. Flynn, J, Waitkins SA. A serum free medium for testing fermentation reaction in *Neisseria gonorrhoeae*. *J Clinic Path*, 1972; 25: 525-527.
16. Odugbemi, TO, Hafiz S, McEntegart MG. Penicillinase-producing *Neisseria gonorrhoeae*: detection by starch paper technique. *BMJ*, 1977; 2: 500.
17. Adebayo JA. Isolation of *Trichomonas vaginalis*: a simple diagnostic medium for use in developing countries. *Med Lab Sci*, 1986; 43: 91-92.
18. Cameron DW, Simonsen JN, D'Costa IJ, *et al*. Female to male transmission of human immunodeficiency virus Type 1: risk factors for sero-conversion in men. *Lancet*, 1989; ii: 403-407.
19. Biggar RJ. The AIDS problem in Africa. *Lancet*, 1986; i: 79-82.
20. Diane S, Plorde DS. Sexually transmitted disease in Ethiopia: social factors contributing to their spread and implications for developing countries. *Br J Vener Dis*, 1981; 57: 357-362.
21. Geddes AM, Bryceson ADM, Thin RN, Mitchell DD. Diseases due to infection In: Edwards CRW, Bouchier IAD, Haslett C and Chilvers E. (eds.) *Principles and Practice of Medicine*. 16th Edition, Edinburgh: Churchill Livingstone. 1995; 65-190.
22. Schaller KF. Treponematoses in Ethiopia. *Int J Dermatol*. 1970; 9: 170-172.
23. Chang WP. General review of health and medical problems in Ethiopia. *Ethiop Med J*, 1967; 6: 9-27.
24. Meheus A, De Clercq A, Prat R. Prevalence of gonorrhoea in prostitutes in a Central African town. *Brit J Vener Dis*, 1974; 50: 50-52.
25. Mann JM, Francis H, Quinn T *et al*. Surveillance for AIDS in a Central African City, Kinshasa, Zaire. *JAMA*. 1986; 255: 3255-3259.
26. Quinn TC, Mann JM, Curran JW *et al*. AIDS in Africa: an epidemiologic paradigm. *Science*. 1986; 234: 955-963.
27. Uribe-Salas F, Hernandez-Avila M, Condo-Glez CJ, Juarez-Figueroa L, Allen B, Anaya-Ocampo R *et al*. Low prevalence of HIV infection and sexually transmitted disease among female commercial sex workers in Mexico City. *Am J Pub Health*, 1997; 87: 1012-1015.
28. Osoba AO. Epidemiology of urethritis in Ibadan. *Brit J Vener Dis*, 1972; 48: 116-120.
29. European HIV SGHT. Comparison of female-male and male-female transmission of HIV in 563 stable couples. European Study Group on Heterosexual Transmission of HIV. *BMJ*. 1992; 304: 809-813.
30. Plummer F, Simonsen J, Cameron D *et al*. Cofactors in male-female sexual transmission of human immunodeficiency virus type 1. *J Infect Dis* 1991; 163: 233-239.
31. Holmberg SD, Stewart JA, Genber AR *et al*. Prior herpes simplex virus type 2 infection as a risk factor for HIV infection. *JAMA*. 1988; 259: 1048-1050.