

BRC 2002007/15106

Seroprevalence of Human Immunodeficiency Virus among undergraduates of University of Benin, Benin City, Nigeria.

M. N. Okolie¹; R. Omoregie^{1*} and C. E. Nwoke¹

¹School of Medical laboratory Science, University of Benin teaching Hospital, P.M.B. 1111, Benin City, Nigeria.

(Received February 14, 2002)

ABSTRACT: A cross-sectional study was performed among 340 undergraduates (151 males and 189 females) of University of Benin, Nigeria. The students aged 16 – 40 years of age were screened for the presence of Human immunodeficiency virus (HIV-1 and HIV-2 antibodies). The collected sera were screened by immunocomb HIV-1 and 2 Bispot and confirmed for HIV-1 and HIV-2 infections using the immunocomb firm 1 and 2 kits respectively. An overall prevalence of 1.2% (4/340) was obtained with HIV-1 accounting for all the positive samples. None of the respondents was HIV-2 reactive. The students below 20 years of age had the highest rate (5.9%) of HIV infection. The males were more infected (2.0%) than the females (0.5%). There was however no association between sex, the monthly expenditure of the undergraduates and HIV infectivity (X^2 : $P>0.05$). There was a significant association between the undergraduates discipline and HIV infectivity with those in the Arts/Social Sciences accounting for the highest rate of infection (4.3%). There is therefore need to intensify campaigns aimed at averting the possible emergence of HIV epidemic in our campuses.

Key words: Human Immunodeficiency virus (HIV-1 and HIV-2 strains), undergraduates.

Introduction

Human immunodeficiency virus (HIV) is the causative agent of Acquired Immunodeficiency Syndrome (AIDS). HIV is a retrovirus made up of two strains, namely HIV-1 and HIV-2^{1,2}. The most prevalent strain of the HIV virus in West and Central Africa is HIV-2³. However, Okolie⁴ have shown that HIV-1 is more prevalent in Benin City, Nigeria.

World-wide over 30 million people are infected by HIV with about 8 million cases of full-blown AIDS and 7,500 new infections occurring daily⁵. It has been estimated that over one-third of today's 15 – year old children may die of AIDS in sub-Saharan Africa⁶.

Ogunleye⁶, reported that nearly 7 million young people, aged 15 – 24 years are currently living with HIV in sub-Saharan Africa.

*Corresponding Author.

Nigeria is said to be having the second largest number of infected adults in sub-Saharan Africa⁷. No fewer than 2.6 million Nigerians are already infected with the virus. At least 55,107 Nigerians have already died of AIDS – related causes⁸. Ogundipe⁸, reported that about 3 million Nigerians aged 15 – 44 years are currently living with the virus.

Since the young people are in the forefront of the AIDS epidemic, we therefore report on the prevalence of the AIDS virus among the undergraduates of University of Benin, Benin City, Nigeria.

Materials and Methods

Study Population

The subjects used in the study were undergraduates of the University of Benin, Benin City, Nigeria. A total of 340 students made up of 151 males and 189 females (aged 16 – 40 years) were screened. A simple survey questionnaire was designed. On the basis of their disciplines, the respondents were grouped into the Medical/Science students (247) and the Social Science/Arts students (93). Conditioned on their monthly expenditure, 79 students spend above average (> N3,000.00), 165 have average expenditure (N2000.00 – N3,000.00), while 96 students spend below average (< N2,000.00).

After obtaining their consent, the participants were counselled both before and after the test. Three replicates of each sample were tested serologically and a 3 randomised sampling was done, statistical analysis was done using 90% confidence limit ($P < 0.05$) and Chi – square at 95% probability (X^2 : $P > 0.05$).

HIV Assay

Approximately 5ml of blood was obtained by venipuncture from each respondent. The sera prepared from blood were aliquoted into three and screened using immunocomb II HIV 1 and 2 Bispot. Confirmation for HIV-1 and HIV-2 infections were by the immunocomb firm 1 and 2 kits respectively. The assay was carried out according to the kits manufacturers instructions.

Seropositivity was determined according to the following criteria. The comb in addition to possessing an upper spot (internal control) should also possess a lower spot (HIV-1 reactive) or a middle spot (HIV-2 reactive) for positive cases. In cases of HIV-1/HIV-2 coinfection, three spots (upper, middle and lower spots) were observed.

Result

Table 1 shows the distribution of HIV antibodies by age and sex of the undergraduates. The male undergraduates had a higher rate of HIV infection (2.0%) than the females (0.5%). There was no statistical association (X^2 : $P > 0.05$) between HIV infection and the sex and age of the undergraduates. HIV infection peaked at the 16 – 20 years old females (6.7%) and the 36 – 40 years old males (5 – 3%).

Table 2 is based on the prevalence of HIV antibodies by sex and monthly expenditure of the undergraduates. HIV infection was more among the undergraduates who spent > N3,000.00 (Above average) monthly (1.3%) as against the 1.2% and 1.0% recorded by the respondents who spent N2,000.00 – N3,000.00 and < N2,000.00 respectively. There was however no statistical association (X^2 : $P > 0.05$) between HIV infectivity and the monthly expenditure of the undergraduates.

The occurrence of HIV antibodies according to the discipline of the undergraduates is outlined on Table 3. HIV infection was detected in 4 (4.3%) of the undergraduates of the Social Science/Arts Faculty. A strong statistical association (X^2 : $P < 0.05$) $Q = 1$ was observed between HIV infectivity and the discipline of the undergraduates.

Table 1: Distribution of HIV antibodies by age and sex of the undergraduates.

Age group (Years)	Males (n = 151)	Females (n = 189)	Total (n = 340)	95% Confidence limit
16 – 20 n = 17	0/2 (0.0)	1/15 (6.7)	1/17 (5.9)	-0.57, 0.43
21 – 25 n = 143	2/84 (2.4)	0/59 (0.00)	2/143 (1.4)	-0.24, 0.24
26 – 30 n = 86	0/23 (0.00)	0/63 (0.00)	0/86 (0.00)	0.00, 0.00
31 - 35 n = 73	0.23 (0.00)	0/50(0.00)	0/73 (0.00)	0.00, 0.00
36 – 40 n = 21	1/19 (5.3)	0/2 (0.00)	1/21 (4.8)	-0.38, 0.50
Total n 340	3/151 (2.0)	1/189 (0.5)	4/340 (1.2)	-0.30, 0.32

Figures in parenthesis represent percentages; n = Sample size

Male Vs Female (X^2 ; $p>0.05$)

Age Vs HIV Infectivity (X^2 ; $P>0.05$).

Table 2: Prevalence of HIV antibodies by Sex and Monthly expenditure of the undergraduates.

Monthly Expenditure	Males (n = 151)	Females (n= 189)	Total (n = 340)	95% Confidence limit
Above Average n = 79	0/2 (0.0)	1/77 (1.3)	1/79 (1.3)	-0.003, 0.029
Average n = 165	1/102 (2.0)	0/63 (0.00)	1/165 (1.2)	-0.002, 0.042
Below Average n = 96	1/47 (2.1)	0/49 (0.00)	1/96 (1.04)	-0.002, 0.044
Total n 340	3/151 (2.0)	1/189 (0.5)	4/340 (1.2)	-0.30, 0.32

Monthly Expenditure Vs HIV infectivity (X^2 ; $P>0.05$) figures in parenthesis are percentages.

Key: Above average = >N3000.00
Average = N2000 – N3000.00
Below Average = <N2000.00
n = Sample size

Table 3: Occurrence of HIV antibodies according to the discipline of the undergraduates.

Discipline	Males (n = 151)	Females (n = 189)	Total (n = 340)	95% Confidence limit
Medical/Science Students (n = 247)	0/96 (0.00)	0/151 (0.00)	0/247 (0.00)	0.00, 0.00
Social Science/Arts Students (n = 93)	3/55 (5.5)	1/38 (2.6)	4/93 (4.3)	-0.014, 0.072
Total (n = 340)	3/151 (2.0)	1/189 (0.5)	4/340 (1.2)	-0.505, 0.534

Discipline Vs HIV infectivity (X^2 ; $P < 0.05$; $Q = 1$)

Figures in Parenthesis are percentage; n = Sample size.

Discussion

An overall HIV prevalence of 1.2% (Table 1) was recorded among the surveyed undergraduates. All were HIV – 1 reactive. Although this type of work has not been done in this area, but when compared with a population based surveillance done in the same area by Phillips⁹, it shows that HIV antibodies is increasing in the area.

The high rate of HIV-1 infection in this study is consistent with previous observations made by Okolie⁴, in the same area, and also in agreement with the observation made among commercial sex workers in Sudan¹⁰. The high prevalence of HIV-1 antibody however disagrees with the findings of Clavel³ in West Africa where he recorded high rate of HIV-2 infection.

Peak infectivity was observed among the 16 – 20 years old females (6.7%) and the 36 – 40 years old males (5.3%). This is consistent with previous observation made in the same area^{4,9}. It is noteworthy that more than half of those infected with HIV are under 25 years of age, making AIDS a major problem of early adulthood in Benin City. A large proportion of the respondents probably became infected during adolescence when they are known to engage in hidden sexual practices. The males in this age group are known to frequent commercial sex workers.

The high rate of HIV infection recorded among the males (2.0%) when compared to their female counterpart (0.5%) is consistent with the 8:1 infection ratio of males to females recorded by Novelo¹¹ in U.S.A. It is also in agreement with the observation made by Bor et al¹² in London, where they recorded higher rate of HIV infection among males (1.75%) as against their female counterpart (0.30%). The higher rate of HIV infection seen among the male undergraduates, disagree with the 1:1 male to female ratio of infection seen in previous studies in the same area⁹. It is also at variance with observations made by Berkley et al¹³, Killewo et al¹⁴ and Barongo et al¹⁵, who reported that women had higher risk of HIV-1 infection than men.

A significant association exists between the rate of HIV infection and the discipline of the undergraduates ($X^2 = P < 0.05$; $Q = 1$) with those in the Arts/Social Sciences recording the highest infection rate of 4.3%. This is probably due to the fact that the Medical/Science students have greater awareness about HIV and AIDS than their counterparts in the Arts/Social Sciences.

Our study shows that HIV-1 is the most prevalent strain with the males having the highest rate of infection. HIV infection predominated among the Arts/Social Science students with the infection being peaked at 16 – 20 years of age. This study therefore supports that HIV screening be included amongst the routine tests for students' medical examination. Our findings calls for more intensified HIV/AIDS enlightenment campaigns in our campuses.

ACKNOWLEDGEMENT: We are grateful to the Petroleum Trust Fund (PTF) for supplying us with the immunocomb II HIV-1 and 2 Bispot and the immunocomb Firm 1 and 2 kits. Special thanks really goes to Dr. O. Okogun, the then medical consultant of PTF, Edo State. We also appreciate the cooperation of our subjects who readily gave us their blood samples, and the university authority for their consent.

References

1. Gallo, R.C.; Salahuddin, S.Z.; Popovic, M. (1984). Frequent detection and isolation of cytopathic retrovirus (HTLV – III) from patients with AIDS and at risk of AIDS. *Science* 224: 500 – 503.
2. Healy, M.; Coleman, T. (1989). A primer on AIDS for health professionals. *Health Education*, 1: 4 – 10.
3. Clavel, F.D.; Mansinho, K.; Chamaret, S. et al (1987). Human immunodeficiency virus type 2 infection associated with AIDS in West Africa. *N. Engl. J. Med.* 316: 1180 – 1185.
4. Okolie, M.N. (1998). HIV strain distribution in Edo and Delta States: Seroepidemiological survey in various populations. Ph.D. Thesis, Uniben, Nigeria, p. 281.
5. Ukwuoma, B. (1997). Combination therapy shows promise on AIDS patients. *The Guardian Newspaper, Nigeria*. Thursday, May 29th, 34 – 35.
6. Ogunleye, G. (2000). AIDS: UN report raises alarm on Africa. *The Punch Newspaper, Nigeria*, Friday, June 30th; 17 (17.909): 3.
7. Eferaro, S. (2000). Curative treatment for those with HIV infection. *The Vanguard Newspaper, Nigeria*, Sunday, March 26th, 16: 8 – 11.
8. Ogunlape, S. (2000). Epidemiology of HIV. *The Vanguard Newspaper, Nigeria*, Sunday, March 26th, 16: 11.
9. Philips, M.N. (1991). Seroepidemiological analysis for HIV-1 antibody in Bendel State. M.Sc. Thesis, Uniben, Nigeria, p. 118.
10. Nkowane, B.M. (1991). Prevalence and incidence of HIV infection in Africa: a review of data published in 1990. *AIDS* 5 (Suppl. 1) 7 – 15.
11. Novello, A.C. (1993). The HIV/AIDS Epidemic: A current picture. *J. Acquire Immune. Defic. Syndr.* 6(6): 645 – 654.
12. Bor, R.; Lipman, M.; EL Ford, J. et al. (1994). HIV Seroprevalence in a London. Same-day Testing Clinic. *AIDS* 8(5): 697 – 700.
13. Berkley, S.; Naamara, W.; Okware, S. et al. (1990). AIDS and HIV infection in Uganda: are more women infected than men? *AIDS* 4(12): 1237 – 1242.
14. Killewo, J.Z.J.; Nyamurye Kunge, K.; Sandstrom, A. (1990). Prevalence of HIV-1 infection in the Kagera region of Tanzania: A population based study. *AIDS* 4: 1081.
15. barongo, L.R.; Borgdorff, M.W.; Mosha, F.F. (1992). The epidemiology of HIV-1 infection in Urban areas roadside settlements and rural villages in Mwanza Region, Tanzania. *AIDS* 6: 1521.