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Prevalence of HIV infection among newly admitted students in Ebonyi State University, Abakaliki, Nigeria

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Abstract:

Background: Human immunodeficiency virus (HIV) and the associated acquired immune deficiency syndrome (AIDS) have remained a serious scourge and a major public health concern, affecting millions in sub-Saharan Africa despite awareness campaigns, preventive measures and promotion of antiretroviral regimens. This study determined the prevalence of HIV among newly admitted students of Ebonyi State University as a measure of the impact of awareness campaign towards prevention of HIV transmission.

Methods: Newly admitted students of Ebonyi State University totalling 2,736 who voluntarily enrolled for the study were screened for HIV infection using the national HIV testing algorithm after information relating to their personal lifestyle, knowledge of safer sex and preventive measures have been obtained with the use of a client intake form.

Results: Of the 2,736 subjects screened, 6 were positive for HIV, giving a prevalence rate of 0.22%, with prevalence rate of 0.29% (4 of 1344) in females and 0.14% (2 of 1392) in males (X^2=0.2041, *p*=0.6514). The positive subjects were spread across age groups 15-19 years (1), 20-24 years (4) and 25-29 years (1). Males and females who have had sex were 801 and 579 out of which 239 and 209 respectively acknowledged to have had unprotected sex within three months of the study.

Conclusion: The low HIV prevalence rate of 0.22% among school age and young adults in this study may indicate that awareness and safe sex campaigns in Ebonyi State have positive impact in HIV prevention amongst these groups of people.

Keywords: HIV, students, Ebonyi State University, Nigeria, prevalence, campaign

Prévalence de l'infection à VIH chez les étudiants nouvellement admis à l'Université d'Ebonyi, Abakaliki, Nigéria

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Abstrait:

Contexte: le virus de l'immunodéficience humaine (VIH) et le syndrome d'immunodéficience acquise (SIDA) associé restent un grave fléau et un grave problème de santé publique, touchant des millions de personnes en Afrique subsaharienne en dépit des campagnes de sensibilisation, des mesures préventives et de la promotion des schémas thérapeutiques antirétroviraux. Cette étude a déterminé la prévalence du VIH parmi les étudiants nouvellement admis à l'Université d'Ebonyi en tant que mesure de l'impact de la campagne de sensibilisation sur la prévention de la transmission du VIH.

Méthodes: Les étudiants nouvellement admis à l'Université d'Ebonyi, sur un total de 2 736 inscrits volontairement à l'étude, ont été dépistés pour l'infection à VIH à l'aide de l'algorithme national de dépistage du VIH, après que des informations relatives à leur mode de vie personnel, à leur connaissance du sexe sans risque et à des un formulaire d'admission du client.

Résultats: Sur les 2 736 sujets dépistés, 6 étaient séropositifs, soit un taux de prévalence de 0,22%, avec un taux de prévalence de 0,29% (4 sur 1344) chez les femmes et de 0,14% (2 sur 1392) chez les hommes (X^2 = 0,2041, *p* = 0,6514). Les sujets positifs étaient répartis dans les groupes d'âge 15-19 ans (1), 20-24 ans (4) et 25-29 ans (1). Les hommes et les femmes ayant eu des rapports sexuels comptaient 801 et 579 personnes, dont

239 et 209 respectivement ont reconnu avoir eu des rapports sexuels non protégés dans les trois mois suivant l'étude.
Conclusion: Le faible taux de prévalence du VIH de 0,22% chez les enfants d'âge scolaire et les jeunes adultes dans cette étude peut indiquer que les campagnes de sensibilisation et de promotion du sexe sans risque dans l'État d'Ebonyi ont un impact positif sur la prévention du VIH parmi ces groupes de personnes

Mots-clés: VIH, étudiants, université d'Ebonyi, Nigéria, prévalence, campagne

Introduction:

Globally, HIV infection has continued to ravage the world for nearly three decades (1). In 2015, an estimated 36.9 million people were reported to be living with HIV worldwide (2). In developing countries, HIV epidemic has increased health challenges and eroded development. It has also facilitated the re-emergence of disease conditions such as tuberculosis (TB) and other opportunistic infections thought to have been controlled (3).

The incidence of HIV/AIDS particularly in Nigeria has been a major source of concern to health professionals, healthcare givers and public health institutions. After the emergence of HIV in Nigeria, the seroprevalence rate increased from 1.8% in 1991 to 5.5% in 2003 but reduced to 3.1% in 2013 (4). Research has shown that Nigeria has the second highest number of people living with HIV in the world after South Africa with about 3.2 million people infected as at 2014 (5). In Nigeria, the HIV epidemic has been described as heterogeneous because prevalence is declining in some communities and states while it is increasing in others (5). The latest report showed that it has indeed declined in most states of Nigeria (6)

HIV has been reported to affect more females than males in Nigeria (7) and to be more prevalent in adolescents than children and old adults (8). The adolescents who exhibit rapid physical and emotional development as well as sexual maturation are more exposed to HIV infection and other sexually transmitted diseases due to their increasing sexual adventure, risky behavioral practices and other factors (9). In 2015, the National Agency for Control of AIDS (NACA) reported a HIV prevalence of 4.2% among adolescents aged 15-24 years who constitute 40% of all reported new cases of HIV in the country (10).

The knowledge of HIV and its mode of transmission are important in its control and eradication. Although several studies have suggested that the level of awareness among Nigerian adolescents is high, especially with regards to prevention and care (11,12,13), the use of condom as a means of preventing the spread of this infection is low among this group. It was reported that 56.4% and 39.6% of adolescent boys and girls respectively had unprotected sex with their partners (14). According to available data from household surveys (2006–2013) in selected countries where adolescent girls were at higher risk of HIV infection, condom usage at last higher-risk sex, ranges from as low as 8.5% in the Democratic Republic of Congo to as high as 52% in Cameroon with 38% rate in Nigeria (15). Increased use of condom could reduce the transmission amongst this age group.

This study determined the prevalence of HIV amongst newly admitted students in Ebonyi State University, Abakaliki and their level of awareness based on campaign efforts of critical stake holders in HIV control and management in the country.

Materials and Methods:

Study setting

The cross sectional study was carried out at Ebonyi State University Ultramodern Diagnostic Laboratory and Research Centre located at the Department of Medical Laboratory Science, Faculty of Health Sciences and Technology, Abakaliki, Ebonyi State, Southeast Nigeria. The laboratory is a research centre of the University, offering special services in all specialties of laboratory medicine. It also serves as a counselling and screening centre of Ebonyi State Agency for the Control of HIV/AIDS with about 4000 clients including newly admitted students of the University counselled and screened for HIV yearly.

Study population

The study population consisted of newly admitted students of Ebonyi State University in the 2017/2018 academic session who consented to and had counselling during their medical screening. The annual students' intake in the University is between 4000-5000 who are usually screened to document their health status. All the subjects were in the age range of 15 - 35 years. Informed consent of the students and appropriate ethical clearance were obtained.

Method for HIV screening

Alere Determine (Alere Medical Co. Ltd. Matsuhidai, Matsudo-Shi, Chiba, Japan), Unigold (Trinity Biotech Plc, Bray, Co. Wicklow, Ireland), and Stat-Pak (Chembio Diagnostics Systems, Inc. Medford, New York, USA) were used for the determination of HIV status. All the reagents were supplied by Ebonyi State Agency for the Control of HIV/AIDS (EBOSACA), Abakaliki. The test was carried out

in line with the approved national algorithm for Nigeria where Alere Determine was used as the first step screening, Unigold was used for confirmation only when Alere Determine was positive and Stat-Pak was used as tie breaker when there was disparity in the results between Alere Determine and Unigold. Tests were carried out following manufacturer's instructions and results were interpreted and recorded as shown in Table 1. The client intake form (HIV counselling and testing form) provided by Ebonyi State Agency for the Control of HIV/AIDS, was used to collect socio-demographic data, knowledge of risk factors, transmission and prevention of HIV/AIDS.

Table 1: National HIV test algorithm in Nigeria

Test 1 (Determine)	Test 2 (Unigold)	Test 3 (Stat-Pak)	HIV status
Negative			Negative
Positive	Positive		Positive
Positive	Negative	Negative	Negative
Positive	Negative	Positive	Positive
Positive	Invalid	Positive	Positive
Positive	Invalid	Negative	Negative

Data analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) software version 20.0 and results presented in frequency tables and simple percentages. Association between categorical variables was tested using Chi-square (X^2) test and the level of statistical significance was set at $p < 0.05$.

Results:

Table 2 showed the gender and age group distribution of subjects. Out of the 2736 subjects screened (1392 males and 1344 females), 6 (2 males and 4 females) were positive giving a prevalence rate of 0.22%. The prevalence was 0.14% in males and 0.29% in females. The association between gender and HIV infection was not statistically significant ($p=0.6514$).

There were 1108 subjects in age group 15-19 years, 1357 in age group 20-24 years, 236 in age group 25-29 years, and only 35 were 30 years and above. The percentage of subjects in age group 15-24 years was 90.1% while the percentage for age group 25 years and above was 9.9%. The prevalence of HIV among subjects in age group 15-24 years was 0.2% while for age group 25 years and above, the prevalence was 0.37% (X^2= 0.3081, 95% CI 0.06442-4.690, $p=0.5789$). Only 1 of 1108 (0.09%) subjects in the age group 15-19 years, 4 of 1357 (0.29%) in age group 20-24 years, and 1 of 236 (0.42%) in age group 25-29 years were HIV positive, while none of the 35 (0%) who were 30 years and above was HIV positive. The association between age group and HIV infection was not statistically significant ($p=0.6316$).

Table 3 showed the frequency of HIV infection in relation to sexual behaviour of subjects and the use of condom. No positive case was detected among 562 males and 370 females who had sex with use of condom prior to the study. Out of 239 males and 209 females who had sex without the use of condom within the time period, 2 and 3 positives cases respectively, were detected (X^2=7.577, $p=0.0059$).

Table 4 showed the subjects awareness of their HIV status. Subjects who knew their HIV status before the study were 553 out of which 1 tested positive. Subjects who did not know their status before the study were 2,183, out of which 5 tested positive. The association between prior knowledge of subject's HIV status and HIV infection was not statistically significant (X^2=0.047, $p=0.8286$).

Table 2: Gender and age group distribution of subjects in relation to HIV infection

Characteristics	Number of subjects tested	Number of subjects positive for HIV (%)	X^2 value	95% CI	*p*-value
Gender					
Male	1392	2 (0.14)			
Female	1344	4 (0.29)	0.2041	0.2110-2.032	0.6514*
Age group (years)					
15 – 19	1108	1 (0.09)			
20 – 24	1357	4 (0.29)	1.724		0.6316*
25 – 29	236	1 (0.42)			
30 & above	35	0			

* Not statistically significant at $p > 0.05$

Table 3: Frequency of HIV infection in relation to sexual intercourse and the use of condom among subjects

Subjects	Sexual intercourse with condom use		Sexual intercourse without condom use		Total	X^2	p value
	Male	Female	Male	Female		7.577	0.0059*
HIV positive	0	0	2	3	5		
HIV negative	562	370	237	206	1375		
	562	370	239	209			
Total	932		448		1380		

*Statistically significant at $p < 0.05$

Table 4: Subject awareness of their HIV status in relation to HIV infection

Subjects	Number tested (%) (n=2736)	Number positive (%) (n=6)	X^2 value	95% CI	p value
Subjects who knew their HIV status	553 (20.2)	1 (0.18)	0.04687	0.1375-4.943	0.8286*
Subjects who do not know their HIV status	2183 (79.8)	5 (0.23)			

* Not statistically significant at $p > 0.05$

Discussion:

HIV is an endemic disease in Nigeria. The findings of this study indicated an overall low prevalence (0.22%) of HIV among newly admitted students of Ebonyi State University. This prevalence is low when compared to the National HIV & AIDS and Reproductive Health Survey (NARHS) (16) which reported a prevalence of 1.1% in the Southeast. The low prevalence could be as a result of increasing awareness of school age children about safe sex and HIV prevention measures. Government, non-governmental (NGOs) and community based organisations (CBOs) have over the years mounted vigorous HIV awareness campaign to stem the tide of HIV scourge. Reports elsewhere have indicated a higher prevalence among these groups (17). The higher prevalence of HIV among females (0.29%) compared to their male counterparts (0.14%) in this study is supported by reports elsewhere (18). Several reasons have been adduced for the higher prevalence among females, including their vulnerabilities, often associated with poor economic and socio-cultural status, shy attitude towards sex education, and abhorrence of sex outside marriage culminating in restriction of young girls from access to sexual health and HIV services.

There was no significant association between age of subjects and predisposition to HIV infection, although the prevalence of HIV infection of 0.3% among age group 20-24 years and 0.42% among age group 25-29 years are higher than 0.09% among the age group 15-19 years, which is consistent with the Nnewi study which reported age group 25-29 years to have the highest prevalence (19), and also with the 2010 HIV survey report of a higher prevalence among age group 20–30 years (20).

Sexual intercourse is a major route of transmission of HIV. Our study showed that 5 of the 448 subjects who had unprotected sex prior to the study were HIV positive and all cases of HIV infection were among those who had unprotected sex. This supports the use of condom as an effective way of preventing HIV transmission. In a review of 14 studies on the use of condom, the incidence of HIV infection among those who always use condoms was 1.14% while it was 5.75% among those who never used them (21).

Awareness of HIV and its mode of transmission are important in its eradication. In this study, the percentage of subjects who had knowledge of their HIV status was low at 20.2% compared to 79.8% for those who were not aware of their HIV status, although the HIV infection rate was not significantly different in the two groups ($p=0.8286$). Nevertheless, the low level of awareness could be attributed to the fact that Ebonyi State is an agrarian state with majority of the families living in rural areas with their children who constitute over 80% of student intake in the university. Although Egbo and Chukwu (22) had reported an appreciable awareness among women farmers of Ebonyi State, our findings suggests otherwise.

Furthermore for fear of death and stigmatization, most of these rural dwellers could not consent to HIV screening test or were completely oblivious of the reality of HIV. Our assertion was reinforced by Adekeye (23), who in his study reported that more than half of the respondents studied did not consent to screening for HIV because of the risk of stigmatization if tested positive, with tendency to suicide as a consequence.

Conclusion:

There was a very low prevalence of HIV amongst newly admitted students of Ebonyi State University, Abakaliki in this study. Majority of the students however had no knowledge of their HIV status, which portends serious challenge to HIV prevention effort. Subjects in age group 20-29 years had a higher prevalence of HIV infection than those in age group 15-19 years, and those above 30 years of age. The use of condom is very important in the control of HIV as no case was recorded amongst those who used condoms. Further studies are recommended to ascertain whether the demographic prevalence observed is wide spread or limited to newly admitted students of Ebonyi State University. Sensitization to increase HIV awareness is advocated to curb further spread of the virus.

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