Prevalence of HIV-1 & HIV-2 Antibodies Among Undergraduate Students Of Uniport, Nigeria.

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ABSTRACT: This study was carried out to determine the prevalence of HIV-1 & HIV-2 antibodies among undergraduate students of Uniport. Determine® HIV-1/2 Test cards, HIV -1/2 Stat- Pak® Assay and HIV Tri Dot were used in a stepwise order for the detection of HIV-1 and HIV-2 antibodies in the blood samples. Overall prevalence rate of HIV was 11.0%, 9(81.8%) were due to HIV-1 and 2(18.2%) were due to HIV-2. Age group 20-35 years of age had the highest prevalence of HIV (14.6%) compared to other age groups. HIV antibodies were more prevalent among females (11.7%)] than their male counterparts (10.0%). HIV prevalence was higher among Muslims 12.5% compared to Christians (10.5%). HIV prevalence was higher the married (11.4%) than singles (10.3%). Statistically, the results showed significant correlation ($p<0.05$) between the age groups and the prevalence of HIV among undergraduate students. However, the study did not find gender, religion and marital status differences ($p>0.05$) in HIV prevalence of undergraduate students. This study however further confirmed the presence of HIV antibodies among undergraduate students. Undergraduate students with HIV should be urged and encourage to take necessary measures to avoid transmitting the virus to others. Continual free HIV screening and counseling services in all institutions of higher learning in the country are further advocated.

1. INTRODUCTION

HIV/AIDS has become one of the most devastating diseases humanity has ever faced (Oppong Asante and Oti-Boadi, 2012). It has become a major public health concern with about half of new infections occurring in young people (UNAIDS, 2010; Oppong Asante and Oti-Boadi, 2012). Sub-Saharan Africa, which has just over 10% of the world's population, remains the most seriously affected region (UNAIDS, 2010; Oppong Asante and Oti-Boadi, 2012).

Sub-Saharan Africa is home to some of the world's most deadly diseases (Longdoh et al., 2012). Sub-Saharan Africa represents a region with overlapping distribution of HIV and malaria, with approximately 22·5 million HIV patients, more than any other region in the world (UNAIDS, 2010; Longdoh et al., 2012). UNAIDS estimates that in 2008 2.7 million people worldwide became newly infected with HIV and 2 million people died from AIDS (Excler et al., 2011). The total number of people living with HIV is estimated to be near 33.4 million, with 97% living in low- and mid-income countries and 48% being women (UNAIDS, 2009; Excler et al., 2011).

Nigeria has the largest population in Africa with a population of over 150 million and HIV prevalence of 4.6% in 2008 (FMOH, 2008; Sanyaolu et al., 2013). It is estimated that 2.95 million individuals live with HIV/AIDS in Nigeria (WHO/UNAIDS/UNICEF, 2008) and integrated control efforts are immeasurably needed (Chukwujekwu et al., 2010; Merrigan et al., 2011; Sanyaolu et al., 2013).

A more serious challenge today, is the growing infection rates among the adolescents in sub-Saharan Africa (Oppong Asante and Oti-Boadi, 2012). This study aimed to determine the prevalence of HIV-1/HIV-2 antibodies among undergraduate students of Uniport, Port Harcourt, Nigeria.

2. MATERIALS AND METHODS

2.1. Study Population

This study was carried out from March, 2011- December, 2011. One hundred undergraduate students of University of Port Harcourt were screened for the presence of HIV–1/HIV-2 antibodies. Undergraduate students were randomly selected and three (3ml) of blood samples were collected in EDTA bottles. Other information such as sex, age, marital status and their religion were collected through a Performa specially designed for this study.

2.3. SCREENING FOR HIV 1 AND 2 ANTIBODIES

The Abbott Determine and Chembio HIV-1/HIV-2 Stak Pak test kits which are single-use immune chromatographic, rapid screening test for human immunodeficiency virus types 1 and 2 were employed in the detection of HIV-1/HIV-2 antibodies.

All tests were carried out according to the manufacturer's specification. To differentiate between HIV-1/HIV-2, HIV Tri Dot was used. This strip is an example of a flow through dot, membrane immunoassay that uses recombination HIV-1/HIV-2 protein antigens. The antigen-antibody reacts to form a complex (Brook et al., 2004).

2.4. DATA ANALYSIS

The prevalence for HIV-1 and HIV-2 antibodies was calculated by using undergraduate students with positive samples as numerator and the total numbers of students enrolled in this study as denominator. The data generated from this study were presented using descriptive statistics. The data was subjected to Fisher's Exact Test for comparison of proportions to determine any significant relationship between infection rate, age, gender, religion and marital status.

3. RESULTS ANALYSIS

3.1. Distribution of HIV-1/2 among Infected Patients

During the study, a total of one hundred (100) samples were screened for HIV antibodies and 11.0% of the samples were sero-positive for HIV, of which nine (81.8%) were due to HIV-1 while 2(18.2%) were due to HIV-2. Table 1 shows the distribution of HIV-1 and -2 among infected patients.

Table 1: Distribution of HIV-1 and 2 among infected patients

HIV serostatus	No. (%)
HIV-1	9(82.0)
HIV-2	2(8.0)
Total	**11(100.0)**

3.2. Prevalence of HIV in relation to Age

Table 2 shows the prevalence of HIV 1 & 2 in relation to ages of the subjects. The prevalence of HIV according to ages subjects showed that the highest prevalence of 14.6% (n=7) was recorded among youths (ages 20-35 years) while the lowest prevalence of 7.1% (n=1) was recorded among teenagers (ages 15-19 years). Statistically, the results showed significant correlation (14.6 vs. 7.1, $p<0.05$) between the age groups and the prevalence of HIV among undergraduate students.

Table 2: Prevalence of HIV in relation to Age

Age groups (years)	No. screened	No. positive (%)
Teenagers (15-19)	14	1(7.1)
Youths (20-35)	48	7(14.6)
Adults (>36)	38	3(7.9)
Total	**100**	**11(11.0)**

3.3. Prevalence of HIV in relation to Sex

Table 3 shows the prevalence of HIV 1 & 2 in relation to sex of the subjects. The study did not find gender differences (11.7 vs. 10.0, $p>0.05$) in HIV prevalence of undergraduate students.

Table 3: Prevalence of HIV in relation to Sex

Sex	No. screened	No. positive (%)
Females	60	7(11.7)
Males	40	4(10.0)
Total	**100**	**11(11.0)**

3.4. Prevalence of HIV in relation to Religion

Table 4 shows the prevalence of HIV 1 & 2 in relation to religion of the subjects. The prevalence of infection according to religion, the highest prevalence of 12.5% was recorded among Muslims while Christians had the lowest prevalence of 10.5%. The study did not find religion differences (12.5 vs. 10.5, $p>0.05$) in HIV prevalence of undergraduate students.

Table 4: Prevalence of HIV in relation to Religion

Religion	No. screened	No. positive (%)
Muslim	24	3(12.5)
Christianity	76	8(10.5)
Total	**100**	**11(11.0)**

3.5. Prevalence of HIV in relation to Marital Status

Table 5 shows the prevalence of HIV 1 & 2 in relation to marital status of the subjects. The prevalence of HIV infection in relation to marital status shows that the highest prevalence of 11.4% (n=7) was recorded among the married while singles had HIV prevalence of 10.3% (n=4). The study did not find marital status differences (11.4 vs. 10.8, $p>0.05$) in HIV prevalence of undergraduate students.

Table 4: Prevalence of HIV in relation to Marital Status

Marital status	No. screened	No. positive (%)
Singles	65	7(10.8)
Married	35	4(11.4)
Total	**100**	**11(11.0)**

4. DISCUSSION

This study was carried out to determine the prevalence of HIV in a population of the undergraduate students of University of Port Harcourt, Port Harcourt, Nigeria. This study was designed for these students belonging to the age groups that drive the HIV/AIDS pandemic. Though, several studies have been done among undergraduates in this environment, the present study became necessary due to the fact that awareness campaigns have increased, it

is therefore assumed that these students were more aware of HIV/AIDS. In 2009, the estimated prevalence of HIV was 17.8% (15-49 year olds) (Joint United Nations Programme on HIV/AIDS, 2010; Peltzer, 2012).

The overall prevalence of HIV in this study was found to be 11.0%, 81.8% were due to HIV-1 while 18.2% were HIV-2. In line with the findings of previous studies, 11.0% infection rate reported in this study is high. In a study in the USA, 30 students were positive for HIV (Gayle et al., 1990). Nwachukwu and Orji (2008) reported a prevalence of 4.8% was reported among fresh graduates and all of them do not have any prior information about their HIV status. Contrastingly, the 11.0% prevalence of HIV reported in this study is higher than the 0.9% previously reported by Mbakwem-Aniebo et al. (2012) among freshmen in Uniport.

Our study reported a significant correlation (p<0.05) between the age groups and the prevalence of HIV among undergraduate students. In this study, undergraduate students' ages 20-35 years old had the highest prevalence of 14.6% compared to other age groups. This age group is also characterized by social vices such as, teenage pregnancy, unsafe abortions, drug use and sexually transmitted infections (FMoH, 2007; Mamman, 2003; Laah, 2003; Mbakwem-Aniebo et al., 2012). This is comparable to the findings of previous studies in some parts of Nigeria and outside Nigeria. Mbakwem-Aniebo et al. (2012) reported that HIV prevalence was higher among age group 20-25years. Laah and Ayiwulu (2010) who reported higher seroprevalence rate of HIV in age group 20-34 years. Macpherson *et al*. (2006) reported in a higher prevalence of HIV among children greater than 15 years of age in Canada. The study by Middelkoop et al. (2011) showed a high force of infection among adolescents, positively associated with increasing age.

Our present study did not find gender differences (p>0.05) in HIV prevalence of undergraduate students. The gender difference in patterns of HIV infection among young people varies substantially around the world and in this study. This compared favourably with the study of Mbakwem-Aniebo et al. (2012) who finds no significant association with the sex of subjects. This finding deviated from the findings of some studies in Nigeria. Laah and Ayiwulu (2010) reported higher seroprevalence rate of HIV in females in Nasarawa State, Nigeria. A few studies have however, documented higher prevalence of HIV/AIDS among males (Celikbas *et al*., 2008; Avert, 2010).

This study also did not find religion differences (p>0.05) in HIV prevalence of undergraduate students. The 10.5% value reported for Christian students in this study is higher the 3.6% reported by Kagimu et al. (2012) in their study and the prevalence of 3.4% that was found earlier in their 2005 national sero-behavioral survey in Uganda (MOH and ORC Macro, 2006; Kagimu et al., 2012). A prevalence of 12.5% prevalence for HIV was reported for Muslims in this study. This is also higher than the 5.0% reported among Muslims in previous studies (MOH and ORC Macro, 2006; Kagimu et al., 2012). According to Kagimu et al. (2012), it is possible that religious practices such as circumcision could partly explain the differences. However, it is not clear whether those who are more religious and adhere to their religious practices have a lower HIV prevalence rate compared to those who do not (Kagimu et al., 2012). It has been suggested by scholars that studies linking religiosity to serological markers of HIV infection are likely to increase understanding of the role of religion in HIV prevention (Trinitapoli et al., 2005; Kagimu et al., 2012).

Though, the highest prevalence of 11.4% was recorded among the married while singles had HIV prevalence of 10.3%. This study did not find marital status differences (p>0.05) in HIV prevalence of undergraduate students. This deviates from what was reported by Mbakwem-Aniebo et al. (2012) who found HIV prevalence to be highest among singles. This might be due to other contributing factor such as as pre-marital and extra-marital sexual contacts which were common in Port Harcourt (Mbakwem-Aniebo et al., 2012). According previous studies, the prevalence of the HIV is fuelled by low levels of male and female condom use, high rates of casual and transactional unprotected sex among young people, poverty, low literacy levels, cultural and religious factors, as well as stigma and discrimination (Avert, 2010; National Population Commission and ICF Macro, 2009; Inungu and Karl, 2010; Mbakwem-Aniebo et al., 2012).

Young people such as undergraduate students are particularly vulnerable to HIV infection because of the physical, psychological, social and economic attributes of adolescence (Earl, 1995; Oppong Asante and Oti-Boadi, 2012). Undergraduate students are also at risk as a result of high risky sexual behaviours, attitudes, and constraints of the societies in which they grow up (Oppong Asante and Oti-Boadi, 2012). Moreover peer pressure to obtain luxury items, such as expensive clothing, jewellery, fashionable hairstyles, accessories, and makeup, motivates young undergraduate females and other young women to engage in transactional sex (Ankomah, 1998; Temin et al., 1999; Longfield et al., 2002; Oppong Asante and Oti-Boadi, 2012).

5. Conclusion

This study has further confirmed the presence of HIV antibodies among undergraduate students. The study found, in concordance with other studies that socio-demographic (such as being older (Grésenguet et al., 2002; Zheng et al., 2010; Peltzer, 2012) was significantly associated with HIV positive status of undergraduate students. The reason for the association between the higher number of older undergraduate students having been tested for HIV, may be that a common pathway of getting tested for HIV in public health facilities in Nigeria (Sethosa and Peltzer, 2005; Peltzer, 2012).

The study also found, in discordance with other studies that socio-demographic (such as being male or female, single or married, Christian or Muslim (Müller et al., 1992; Phanuphak et al., 1994; Kawichai et al., 1999; Grésenguet et al., 2002; Seme et al., 2005; Korra et al., 2005; Chu et al., 2005; Khongphatthanayothin et al., 2006; Biadglegne et al., 2010; Mbakwem-Aniebo et al., 2012), were significantly associated with HIV positive status of undergraduate students. Undergraduate students with HIV should be urged and encourage to take necessary measures to avoid transmitting the virus to others. Continual free HIV screening and counseling services in all institutions of higher learning in the country are further advocated.

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