Prevalence of Human Immunodeficiency Virus (HIV) Antibody among Subjects in Ogba/Egbema/Ndoni Local Government Area (LGA) of Rivers State of Nigeria

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Abstract

Background: The World Health Organization in approximation, reported that in 2007, about 33 million people were HIV infected globally, and approximately 2.5 million were newly infected, even as over 2 million died of AIDS despite all the huge prevention and intervention strategies in place. Although, there seems to be insufficient data regarding Human Immunodeficiency Virus infection prevalence in rural communities of Niger Delta as reported by many scholars in the region. The aim of this present study therefore, was to investigate the seroprevalence rate/prevalence of Human Immunodeficiency Virus infection in Ogba/Egbema/Ndoni LGA of Rivers State.

Methods: In this Cross-sectional study, a total of 1,484 subjects with age range of>15 years were screened for Human Immunodeficiency Virus infection in Omoku General Hospital and Erema General Hospital, all in Ogba/Egbema/Ndoni Local Government Area of Rivers State of Nigeria. Result.

Results: The result of the study showed an overall prevalence rate of 10.6%. The highest Human Immunodeficiency Virus seropositive infection occurred in age group 21-26years (30.6%) with a prevalence rate of 3.23%. The female had the highest prevalence of 7.61% while the male stood at 2.96%. There was no statistical significant difference (X^2=0.002; P>0.05) in prevalence based on marital status, even as the married had a prevalence of 5.73% while singles had 4.85% respectively.

Conclusion: This study showed that inspite of the massive Human Immunodeficiency Virus campaign advocacies in the urban cities in the region, there is still much to be done especially in the rural villages in the region. This calls for intensified efforts on health education on the risk factors and strong awareness on attitudinal change program of the citizens. The need to strengthen the strategy of antiretroviral therapy provision in the rural villages would help to reduce Human Immunodeficiency Virus related mortality and morbidity in the infected persons in Niger Delta Communities.

Keywords: Incidence; Human Immunodeficiency Virus (HIV); Antibody; Niger Delta Communities; Lack of health infrastructure

Introduction

The Human Immunodeficiency Virus (HIV) is an enveloped lentivirus within the family retroviridae. Its genetic material has a single nucleic acid structure thus, simply known as an RNA virus (ribonucleic acid) [1,2]. The modes of HIV transmission is via direct inoculation into the blood stream or after contact and attachment through mucosal surfaces. Furthermore, HIV can also be transmitted through direct contact with a bodily fluid containing HIV such as blood, semen, vaginal fluid and breast milk

as reported by Azuonwu [3]. Moreover, the transmission could involve anal, vaginal or oral sex, blood transfusion, contaminated hypodermic needles, exchange between mother and child during pregnancy, child birth, or breast feeding [2,4,5]. An infection can occur when the virus crosses the body epithelial barriers into the fluid compartments. Because the blood, semen, vaginal secretion of infected subjects, harbours high level of free virus, and infected leukocytes, which are significant factors in sexual transmission pathway. Though this virus can be isolated form urine, tears, sweat, and salver, but in such small quantity, which may not be considered as source of infection [2,4].

It is also believed that, Acquired Immunodeficiency Syndrome (AIDs) is a condition caused by infection with Human Immunodeficiency Virus (HIV), as a result of damage to the cells of the immune system particularly, clusters of differentiation four (CD4+) [6]. The clusters of differentiation four (CD4+) cells which are vital to human immune system, are the target cells of HIV; the CD4+ cells are lymphocytic cells that serves as receptors (binding sites) for the virus and this makes the CD4+ cells prone to HIV attack because, these cells are firstly infected by the virus leading to reduction in the leukocyte cell population, which will in-turn suppress the immune system of the host [6,7].

According to the 1993, revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults in HIV positive treatment naive patients, this replication continues and the on-going viral replication and infection of cells leads to CD4+ cell destruction and depletion resulting in immune system dysfunction. Once the CD4 cell count has decreased to<200/mm^3 or<14%, HIV infection is known as the Acquired Immunodeficiency Syndrome (AIDS). AIDS is manifested by development of opportunistic infections (OIs) and HIV associated malignancies [6,7].

Previous studies reported that there are two strains of HIV namely HIV 1 and HIV 2. HIV 1 was first discovered, it is believed to be more virulent and easily transmitted. It is the most common strain found Worldwide [8-10]. Conversely, HIV 2 is found mainly in Western Africa and in scanty distribution in other parts of the world. It was also reported that, HIV 1 is predominant with 97.6% when compared to HIV 2 with 2.4% [10].

The major global predisposing factor for HIV infection is heterosexual contact but recently the prevalence of HIV amongst homosexual is on the increase. In the United States, approximately one million people are infected with HIV and 25% do not know they are HIV infected. Similarly, the Centre for Disease Control department of HIV/AIDS Statistics and Surveillance estimated that about 40,000 new HIV infections occur in the USA every year. Although the average age of an HIV-infected person in the USA is approximately 30 years, the number of people living with HIV over the age of 50 years is increasing significantly. This reflects the marked decline in HIV related mortality as a result of effective HIV treatment [11].

In addition, WHO figures put the number of people living with HIV/AIDS worldwide at between 32 million and 38 million. The prevalence of HIV infection was initially high. HIV (human immunodeficiency virus) infection has now spread to every country in the world. Statistics show that approximately 40 million people are currently living with HIV infection, and an estimated 35 million have died from this disease since the beginning of the epidemic. In the United States, approximately 1 million people are currently infected [12]. Furthermore, a report from the Joint United Nation Program on HIV/AIDS, UNAIDS and WHO estimated that in 2007 about 33 million people were HIV infected globally and approximately 2.5 million were newly infected, and over 2 million died of AIDS as at that time [13].

Moreover, Sub-Saharan Africa remains the region most heavily affected with HIV. In 2009, sub-Saharan Africa accounted for 67.6% of HIV infections worldwide. The region also accounted for 72.2% of the world's AIDS-related deaths in 2009. However, there is a marked decrease. In Africa, South Africa ranks highest followed by Nigeria, with about 3 million infected persons. It is believed that between 50,000 and 100,000 children are born annually with HIV in Nigeria. Though the scourge of HIV has been predominantly devastating in sub-Saharan Africa firstly, South Africa and secondly Nigeria, but infection rates in other countries remain high. In a new national survey conducted by the federal government of Nigeria buttressed this fact for the 2012 National HIV/AIDS and Reproductive Health Survey-Plus (NARHS Plus, 2013) Nigeria's HIV/AIDS prevalence rate is now 3.4 percent. Rivers State having the highest in the country with prevalence rate of 15.2 percent [12].

HIV/AIDS has no cure; however, the possibility of managing the illness is guaranteed now with the advent of antiretroviral therapy such that a patient can live an almost normal and fulfilled life thus, there is need to ascertain the status of the people around this region as well as the prevalence of HIV because the issue of industrialization have posed threat to increased infection as seen in previous studies [3,13], by probably increasing the level of promiscuity and unhealthy life styles among the people, especially the female folks who opt for commercial sex practices as means of livelihood with the staff from of the multinational firms present in this region.

Furthermore, despite the awareness and campaign echoed by World Health Organization, UNICELF, Ministry of Health and other agencies like Non-governmental agencies, many people within the region of this present study have not fully utilized this opportunity therefore, this study was aimed at understanding the trend of the HIV/AIDS epidemic in the region and to determine the prevalence rate of HIV/AIDS infection in Ogba/Egbema/Ndoni Local Government Area of Rivers State, Nigeria. It is strongly believed that data generated from this study would help to develop more robust and sustainable strategies on how to control the rising trend of the epidemic in our local communities cum region at large.

Methods

Study design and setting

The study adopted the observational cross sectional sero-prevalence design using descriptive and exploratory approaches

which was conducted in two main General Hospitals in the region) Omoku General Hospital and Erema General Hospital) both in Ogba/egbema/Ndoni Local Government Area of Rivers State, Nigeria.

The study area covered Ogba/Egbema/Ndoni Local Government Area which is located at the Northern pole of Rivers State of Nigeria, which is the mainstay oil and gas activities, thus playing host to myriad of oil and gas multinationals and allied industries. These had consequently brought in a combination of good and bad element gains of its connections with the petroleum industry in the course of the diverse progressions of modernization and urbanization. Nevertheless, this region is a key industrial area as it has a large number of multi-national firms like AGIP, ELF, Mobil, Chevron etc., as well as other industrial activities, particularly business related to the petroleum industry and gas exploration. The growth of the area is further rising exponentially due to its position as the leading industrial city of the former eastern region of Nigeria and its importance as the centre of social and economic life of Rivers State [14]. The disadvantage of the effect of this industrial activities triggered an unprecedented public health and environmental related hazards to the inhabitants of oil producing communities, as seen in the area of this present study (Ogba/Egbema/Ndoni Local Government Area of Rivers State of Nigeria), however till date, there seems to be no visible and sustainable plans of environmental remediation by the major actors to ameliorate the situation [15,16]. However, the livelihood of the people is mainly agriculture (fishing and farming) which their environment has remained contaminated over time.

Sample size and sampling technique

A total of one thousand four hundred and eighty-four (1484) subjects visiting both hospitals were screened for Human Immunodeficiency Virus (HIV) type 1 and 2 antibodies, within the period of February to December 2008 respectively. Sample Size Calculator used was Winpepi version 11. 44, under describe program version 2.72 "K Sample size (to estimate proportion/rate/mean, or find cases" (Abramson, 2015).

The use of different methods (triangulation) to evaluate the same evidence thereby, minimizing the impact of bias increasing the credibility and validity of the study in an attempt to map out and explain result fully from various standpoints by taking the strength of each while reducing the weaknesses of each. For this study, a multistage sampling procedure was adopted. It is initially started with the purposive selection of the health care facilities within the region under study (convenience sampling) to choose the facilities which were used; convenience because of the hard to reach (remote) areas however, the two main General Hospitals in the region (Omoku General Hospital and Erema General Hospital) both in Ogba/egbema/Ndoni Local Government Area of Rivers State, Nigeria; situated within the local government area head quarter were used. Furthermore, for selection of subjects; the study employed systematic random sampling technique in which case samples were selected at a predetermined interval with the attendance sheet used as the sample frame till the estimated sample sized was achieved.

Data collection

Both primary and secondary data were used as qualitative instruments for the investigation. Eligibility for this study included subjects aged 15 years and above who were willing to give both verbal and written informed consent. In addition, demographic data of the patient's age, marital status and sex were obtained via an interview and administered questionnaire.

Sample Collection /Experimental involved aseptically 2.5ml of whole venous blood were collected from each subject and were dispensed into a plain tube. The blood was allowed to clot and the serum sample were separated and analyzed or stored at 2°C until analyzed. The detection of antibodies to Human Immunodeficiency Virus type 1 and 2 were detected using Alere determines kit and Stat-Pak Kit, manufactured by Alere Medical CO. Ltd Japan and CHEMBIO Diagnostic systems, INC, USA respectively. The Alere determine kit was used first; reactive tests were repeated at least once to avoid false positive results and confirmed using Stat-Pak Kit. The kits were used in accordance with the manufacturer's standard operating procedure respectively.

Data analysis

The statistical analysis involved data collection, collation in Microsoft Excel Spread Sheet and analyzed using the statistical package for social science (SPSS) version 20.0, values were expressed as percentages and P-Value<0.05 were considered statistically significant using Chi Square distribution for categorical data.

Ethical considerations

Ethical Consideration was obtained from the Rivers State University, Nkpolu Port Harcourt Rivers State of Nigeria and the Rivers State Hospital Management Board Rivers State, Nigeria. Also, permission was obtained from the Principal Medical Officers/Laboratory scientists of the various health care facilities used in this study all in Rivers State of Nigeria. In addition, informed and written consent was obtained from the study participants after a detailed explanation of the study aim and procedure were made known to them. However, the information of the subjects was treated with high level of confidentiality.

Results

The result of the prevalence of HIV infection in Ogba/Egbema/Ndoni LGA of Rivers State (**Table 1**). A total of 1,484 subjects with the ages>15 were screened, out of which 157 (10.6%) were sero-positive for HIV antibodies while 1327 (89.4%) were sero-negative. The prevalence of HIV infection was highest within 21-26years (3.23%) while the lowest prevalence occurred within 57-62 years (0.07%).

Furthermore, **Table 2** shows the frequency and chi-square distribution of HIV infection in relation to gender (sex) and marital status. The prevalence of HIV is higher in female 7.61% while male stood at 2.96%. The result also show an increase prevalence in married 5.73% while single were 4.85% respectively. The Chi square distribution showed no evidence of statistical significance as between the male and female in terms of distribution of HIV infection based on gender as well as no disparity was seen between the married and single groups (marital status) respectively (X^2=8.92 and 0.002; P>0.05).

Table 1 Descriptive statistics frequency distribution among subjects.

Age Group (Years)	No Tested	HIV Positive (%)	% Prevalence	HIV Negative
		N=1,484; Frequencies (%)		
15 – 20	205 (13.8%)	8 (5.1%)	0.54	197 (14.8%)
21 – 26	405 (27.3%)	48 (30.6%)	3.23	357 (26.9%)
27 – 32	347 (23.4%)	46 (29.3%)	3.09	301 (22.7%)
33 – 38	163 (10.9%)	27 (17.2%)	1.82	136 (10.2%)
39 – 44	102(6.8%)	12 (7.6%)	0.81	90 (6.8%)
45 – 50	123 (8.3%)	11 (7.0%)	0.74	112 (8.4%)
51 – 56	32 (2.2%)	4 (2.5%)	0.27	28 (2.1%)
57 – 62	46 (3.1%)	1 (0.6%)	0.07	45 (3.4%)
63 – 68	20 (1.3%)	0 (0%)	0	20 (1.5%)
69 & Above	41 (2.7%)	0 (0%)	0	41(3.1%)
Total	1484	157	10.57	1327

Note: Descriptive statistics of study participants with respect to age group.
N = Number of study Participant
No = Number
% = Percentage
HIV = Human Immunodeficiency Virus

Table 2 Frequency and Chi Square Distribution according to marital status.

Variables	No Tested	HIV Positive	% Prevalence	X²	P-value
		Frequency			
		Gender (Sex)			
Male	650 (43.8%)	44(28.0%)	2.96	8.92	
Female	834(56.2%)	113(71.9%)	7.61		
		Marital status			
Married	800 (53.9%)	85(54.1%)	5.73	0.002	P > 0.05
Single	684(46.1%	72(45.8%)	4.85		

Note: Frequency and chi-square distribution for HIV positive individual among the study participants in relation to gender (sex) and marital status.
N=Number of study Participants
No=Number
%=Percentage
X²=Chi Square
HIV=Human Immunodeficiency Virus

Discussion

This present investigation has revealed the prevalence of HIV infection in Ogba/Egbema/Ndoni Local Government Area of Rivers State. In this study, we observed an overall sero-prevalence of 10.6%. This finding is consistent with previous report in other part of Niger Delta communities as reported by Azuonwu [3], with a prevalence of 15.0% [17]. The value obtained in this study is however much higher than the National sentinel sero-prevalence rate of 3.4%, this may probably be due to the sample size of the study or lack of knowledge about the mode of transmission and risk factors among the subjects, which includes high risk sexual behaviour, homosexual and hetero sexually promiscuity of some of the subjects living in the region. This finding is in agreement with WHO, UNAIDS, UNICEF (2008), report that, hetero-sexual sex contributes about 80% of the total HIV transmission in Nigeria [14].

In this study we observed that, the prevalence of HIV infection based on gender specific anatomical and physiological characteristics, is higher in female than in male; though the result revealed no association between male and female as well no indication of a relationship between married and single with regards to Human Immunodeficiency Virus infection amongst the population studied. This result is in corroboration with Azuonwu [3], finding, which reported that, there were twelve to thirteen HIV infected women for every infected man [3]. This fact may be due to casual attitude towards sex, tendencies towards multiple sex partners and risk behaviours (like sharing of sharp objects), that make them vulnerable to infection. In addition, most of the female may have been victim of rape, which is common in rural areas. On the other hand, this present study is in contrast with the 2010 report by Azuonwu and colleagues that reported higher prevalence in male than females though among oil workers and students [17].

Amongst the age group the study showed that the infection is higher in 21 – 26years followed by 27-32 years. This finding is in agreement with WHO, UNAIDS, UNICEF, (2008) report which shows that, young people between 15-24 years had prevalence more than 40% [13]. This finding may be due to the fact that, young people may probably engage in the act of multiple sex partner which most of them do for fun, and most of them may have had sex in exchange for gift (money) or favour due to their situation or poverty they find themselves within the region of present study, because with the oil and gas company operating

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in the region of this present study, there seems to be high level of social interactions among the young females and the multinational staff. The multinational staff and the rich elements in the region may tend to use money to lure the young ones into sex and most times, the HIV status of both parties might not be known. Furthermore, the predisposing factors that could be attributed with HIV/AIDS across rural communities in developing countries like sub Saharan Africa are namely; high levels of unemployment, poverty, low level of literacy as well as little or no application of best practices/prevention strategies coupled with gaps in the existing HIV/AIDS programs to mention but a few [13]. It is a known fact that 70% of the population derives their daily low income from subsistence farming and fishing. The young adults tend to be more susceptible because they device another means of survival which is through commercial sex and this could account for the reason why female prevalence rate of HIV/AIDS seems higher compared to males as reported in this study. The presence of oil and gas staff and other allied industries in the area have continued to raise a lot of massive concern to health professionals and other relevant stakeholders, given the level of social mix-up that has continued to promote rapid spread of sexual transmitted diseases in the region, with little or no health facility on ground for sustainable intervention and treatment. Also, the area of this present study is the local government area headquarter so, people of high socio-political status also live and do business as well, within the area of study, this could contribute immensely in no small measure to the increasingly trend of the epidemic in the region [17,18].

Conclusion

The prevalence of HIV Seropositivity in Ogba/Egbema/Ndoni LGA of Rivers State has been established given the above trend. However, from the study, the incidence of HIV infection in the area may be on the increase, if urgent necessary preventive measures are not taken into action. Therefore, there is the need to stimulate efforts to minimize the incidence, thus providing appropriate intervention for the management of HIV infections in the rural area of Niger Delta.

We hereby recommend that the HIV/AIDs program and its intervention program for prevention and control should be extended to rural communities in the region. Also the improvement of the health care system services especially at the level of primary health care in the rural area; and provision of anti-retroviral regimen in rural areas. Furthermore, there is need for robust training of more nurses, medical doctors, medical laboratory scientist and other health professionals as counsellor and retraining of counsellors. The public health education campaign program and adverts about HIV/AIDS should be strongly underpinned in our secondary schools and community health centres in the region; even with the use of local dialect among local dwellers.

Acknowledgements

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