ORIGINAL ARTICLE

Sero-prevalence of HIV Antibodies In Pregnant Women in Port Harcourt, Nigeria.

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ABSTRACT

Background: *The aim of the study was to determine the Sero-Prevalence of HIV antibodies in pregnant women attending the antenatal clinic at the University of Port Harcourt Teaching Hospital , Port Harcourt.*

Method: *Serial recruitment of 600 women who attended the antenatal clinic. HIV screening was done by rapid ELISA technique. Positive samples were re-tested with a second rapid ELISA kit, with only samples sero-positive with both kits being taken as truly sero-positive.*

Results: *The sero-positivity rate was 7.3% Sixty-nine point seven percent (69.7%) of all sero-positive cases were primiparae, with 84% in advanced stages of pregnancy (2nd and 3rd trimesters). History of blood transfusion, dental manipulations, tattooing and circumcision did not contribute significantly to increased HIV sero-positivity.*

Conclusion: *There is high HIV sero-positivity rate among pregnant women attending antenatal clinic in Port Harcourt. The implications of this finding in relation to vertical transmission, transmission of nosocomial infection and increased occupational exposure of laboratory and hospital staff to HIV infection is discussed. Compulsory routine screening of all pregnant women attending antenatal clinics in Sub-Saharan Africa is advocated.*

KEYWORDS: *Sero-Prevalence; HIV; Pregnant Women; Port-Harcourt*

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INTRODUCTION

Human Immune deficiency virus infection has become a pandemic. Globally, about 45 million people are estimated to be infected and more than half of them are women, and children [1]. Sub-Saharan Africa has been the most devastated region accounting for about two thirds of all infected adults and over 90% of infected children[1,2]. In Nigeria, about 5-8 million people are estimated to be living with the virus [3].

Despite several public health intervention measures aimed at breaking and reducing the transmission rate, the prevalence of HIV in Nigeria continues to increase, rising from less than 1% in 1990 to 1.2%(1991/92); 3.8%(1993/94); 4.5%(1995); 5.4%(1999) and 5.8%(2001).

The most important route or transmission of HIV in Sub-Saharan Africa, including Nigeria, is through sexual intercourse, which is largely heterosexual [1,2]. It is possible that persistent indulgence in risky sexual behaviour may be contributing significantly to the increasing prevalence of HIV in Sub-Saharan Africa.

Mother To Child Transmission (MTCT) or vertical transmission is the next most important route of HIV transmission in Sub-Saharan Africa, accounting for over 90% of infections in Children [6,7]. The number of children living with HIV infection globally is estimated at 1.3 million, with 33.8 million deaths since the epidemic began [1]. Sub-Saharan Africa harbours most of these infections and deaths, accounting for over 90% of the world's children with HIV. It is estimated that about 2.4 million HIV-positive women get pregnant each year with about 600,000 children getting infected through MTCT (vertical transmission) each year and about 1600 to 1800 children getting infected every day through this mechanism [6,8].

HIV infection has thus become one of the most common complications of pregnancy in some developing countries[2]. This has major implications for the management of pregnancy and birth. If the HIV status of a pregnant woman is known, several intervention strategies are now available that can substantially reduce the rate of mother to child transmission (MTCT)[2]. Presently, there is no policy for routine screening of pregnant women for HIV infection in Nigeria. Hence many HIV sero-positive pregnant women may go through antenatal care and deliver their babies without any intervention measures to reduce the risk of vertical transmission. Even in the post-natal period, no measures are taken to reduce MTCT because of lack of knowledge of their HIV status. Additionally, laboratory and other health workers in the hospital may be inadvertently exposed to more occupational risk of HIV infection because of lack of proper identification and flagging of HIV-positive serum or other biological fluids from infected pregnant women.

This study was therefore designed to assess the HIV infection burden in pregnant women in Port Harcourt. The study will also assess the risk burden of MTCT, which will help in formulating adequate strategies for the reduction of vertical transmission of HIV in the local community.

PATIENTS AND METHODS

Six hundred (600) patients attending the antenatal clinic of the University of Port Harcourt Teaching Hospital

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were serially recruited into the study. For each patient, socio-demographic and obstetric data and previous medical history were obtained from the case-notes and personal interviews. Five (5ml) of blood was then collected from each patient by venepuncture.

For each patient, a study data sheet bearing a study number was completed. In order to maintain confidentiality, use of names for identification of study subjects was avoided. Informed consent was obtained from the patients prior to recruitment.

HIV screening was done using a rapid ELISA Kit (Determine HIV- 1/2, Abbot Laboratories). Sero-positive samples were re-tested with a second rapid ELISA Kit (Immuno Comb 11 HIV 1 & 2; Bispot, Organics, Israel). Only samples that were sero-positive with both kits were taken as truly sero-positive. The results are reported as percentages of the total population. The Chi square test was used to compare the differences in the results from various sub groups. $P< 0.05$ was regarded as statistically significant.

RESULTS

Sero-positivity rate

Out of a total of 600 subjects enrolled into the study, 44(7.3%) tested positive to HIV, while 556(92.7%) were sero-negative.

Age Of Subjects

Ninety-six percent (96%) of the subjects were within the age bracket of 20-39 years; 2.7% of the subjects were less than 20 years of age while 1.3% were aged 40 years or above. Similarly, 90% of all sero- positive cases were also within the age bracket of 20-39 years, while only 9.1% (4) of the sero-positive cases were less than 20 years of age.

Gestational Age

Most of the study subjects were in the 2nd trimester (54.7%) or 3rd trimester (35.7%) of pregnancy, while only 9.6% were in the 1st trimester of pregnancy. For the sero- positive subjects, only 16% were in the first (1st) trimester, while 42% each, were in the 2nd and 3rd trimesters.These results merely reflect the booking pattern in our local community. Most pregnant women only come to book in the antenatal clinic when their pregnancies have advanced beyond the first trimester.

Parity of Subjects

Majority of the study subjects were either para 0 (primigravidae) (61.4%) or para 1 (18.8%). The number of subjects decreased with increasing parity. The proportion of sero-positive cases also followed the same pattern, with 69.7% of the subjects being primigravidae (para 0), while only 12.1% and 9.1% were Para 1 and Para 2, respectively.

Contributory/predisposing Factors

The influence of some pre-disposing/contributory factors is summarized in Table I.

(a)**Blood Transfusion**

Previous history regarding blood transfusion was obtained from 561 study subjects, from among whom only 38 or 6.8% had had a blood transfusion in the past while 523 or 93.2% had no transfusion. Only 1(2.6%) out of the 38 subjects with previous history of blood transfusion was sero-positive. Of the 523 subjects who had no history of blood transfusion, 39(7.5%) were sero-positive for HIV. The difference in sero-positivity rates was not statistically significant ($p> 0.05$). This pattern of results suggest that factors other than blood transfusion may be more important in the transmission of HIV in this locality, as is already known.

(b)**Dental Manipulations**

History regarding dental manipulations was obtained from 536 study subjects, of whom 120(22.4%) had had dental manipulations in the past while 416(77.6%) had had no such manipulations. Of the 120 with previous dental manipulations, only 5(4.2%) were sero-positive for HIV, while out of the 416 subjects with no history of dental manipulations, 34 (8.2%) were sero-positive for HIV. The difference in sero-positivity rates was not statistically significant ($p>0.05$). This pattern of results also suggests that dental procedures may not be a prominent route for the transmission of HIV infection in this locality.

(C) **Tattoos**

Information regarding tattoos was obtained from 565 subjects. Two hundred and twenty (220) (38.9%) had had a tattoo, while 345(61.1%) had had no tattoo. Of the 220 that had had tattoo, 18(8.2%) were sero-positive for HIV while of the 345 subjects with no history of tattoos, 25 (7.2%) were sero-positive for HIV. The difference in the sero-positivity rates between the two groups was not statistically significant ($p>0.05$). This result also suggests that tattooing may not be a significant route of HIV transmission in this environment.

(d) **Circumcision**

Responses regarding circumcision was obtained from 551 subjects. 173 (31.4%) were circumcised while 378 (68.6%) were uncircumcised. fourteen (8.1%) of the 173 circumcised subjects were sero-positive for HIV while 29(7.7%) of the 378 uncircumcised subjects were sero-positive for HIV. The difference in the sero-positivity rates between the two groups was not statistically significant ($p>0.05$). Once more, this result suggests that circumcision may not be an important route of transmission of HIV in our locality.

Table 1. Distribution Of Sero-positivity Rates With Different Pre-disposing/contributory Factors

S/N	CONTRIBUTORY/ PREDISPOSING FACTOR	NO. OF SUBJECTS	POSITIVE HISTORY			NEGATIVE HISTORY			REMARKS
			No. of Subjects	No. of Sero-Positive	No. of Sero-Negative	No. of Subjects	No. of Sero-Positive	No. of Sero-Negative	
1	Blood Transfusion	561	38 (6.8%)	1 (2.6%)	37 (97.4%)	523 (93.2%)	39 (7.5%)	484 (92.5%)	NS
2	Dental Manipulations	536	120 (22.4%)	5 (4.2%)	115 (95.8%)	416 (77.6%)	34 (8.2%	382 (91.8%)	NS
3	Tattoos	565	220 (38.9%)	18 (8.2%)	202 (91.8%)	345 (61.1%)	25 (7.2%)	320 (92.8%)	NS
4	Circumcision	551	173 (31.4%)	14 (8.1%)	-	378 (68.6%	29 (7.7%)	349 (92.3%)	NS

NS: DIFFERENCE IN SERO-POSITIVITY RATE NOT STATISTICALLY SIGNIFICANT.

DISCUSSION

Port Harcourt is the capital of Rivers State, one of the 36 constituent states that make up Nigeria, the most populous country in Sub-Saharan Africa. It is situated in the oil-rich Niger Delta region and is the centre of the industry (the major foreign exchange earner) in Nigeria. Because of the capital intensive and lucrative nature of the oil industry, Port Harcourt is highly cosmopolitan, and attracts a lot of local and foreign employees.

Furthermore, oil operations involve working on oil-rigs, which are mostly located in remote, under-developed and poverty-stricken rural areas of the Niger Delta or off-shores. Thus oil workers mandatory work alternately on and off the oil-rigs for varying periods of time. While working on the rig, they are separated from their families and spouses living in the big city of Port Harcourt and its environs.

Because the oil workers are well paid and therefore relatively rich, there is usually an influx of poor rural women (both married and unmarried) and commercial sex workers to areas hosting oil rigs. Thus a conducive environment for the transmission of HIV through heterosexual intercourse, with its multiplier effects, is created in the Niger Delta, with Port Harcourt as an epicentre.

The results of this study show a high sero-prevalence rate (7.3%) of HIV antibodies in pregnant women in Port Harcourt. This is much higher than the national average sero-prevalence rate of 5.8% [2], indicating that Port Harcourt is one of the focal areas of high HIV prevalence in Nigeria. Compared to southern Africa, the most HIV-devastated region of Africa, our rate of 7.3% is relatively low, though we may be fast approaching their rates. In Kenya, Malawi, Namibia, Rwanda, South Africa, Tanzania, Zambia and Zimbabwe, over 10% of women attending antenatal clinics in urban areas are HIV-positive, with rates of almost 60% in some sites [5-9].

A sero-prevalence rate of 7.3% in pregnant women attending the antenatal clinic also suggests that the sero-prevalence rate of HIV in the general population in Port Harcourt may be about 7.3% or higher. Sero-prevalence rates in antenatal women have generally been taken as a good indication of the rate of infection in communities [10,11]. However, it is also known that sentinel surveillance at antenatal clinics may underestimate the population prevalence, as shown in a study in the Mwanza district of Tanzania, where the prevalence in antenatal attendees was below that of the general population by a factor of 0.75 [12]. This may be a reasonable assertion because most pregnant women attending antenatal clinics in Nigeria are usually married and they and their spouses may have less indulgence in risky sexual practices/ behaviour as compared to single, unmarried women. Furthermore, a decrease in the fertility of HIV-infected women, both from sub-fertility and from increased early pregnancy loss, as reported from the Rakai district in Uganda, have also being given as reasons that may further exacerbate this under-estimation [13].

The results of this study reveal that most (90%) of the HIV- sero-positive pregnant women were young (20-30 years), in their first pregnancies, (69.7%) and were already in advanced stages of pregnancy (84% in 2nd and 3rd trimesters).

Furthermore, the results show that blood transfusion,

dental procedures, tattooing and circumcision were not major contributory factors to the risk of HIV infection in our locality. Since intravenous drug use is not yet common in our society and most of the study subjects were in the sexually active age bracket, it would be reasonable to conjecture that infection through heterosexual intercourse may be the predominant mode of transmission of HIV in our locality, as in the rest of Sub-Saharan Africa [4,5,14]. This pattern of results suggests serious implications for the socio-economic development of Port Harcourt in particular and the Niger Delta region of Nigeria, in general, considering the conducive and permissive sexual environment engendered by the oil industry and the known socio-economic implications of a high HIV-infection and transmission burden on any community. Another direct consequence of the high sero-positivity rate (7.3%) of HIV in pregnant women in Port Harcourt is a high-risk burden of mother to child transmission (MTCT) of HIV infection. Most Nigerians, including pregnant women are unaware of their HIV status. This is partly due to the fact that there are as yet no mandatory HIV screening regulations for pregnant women attending antenatal clinics as for example, at the University of Port Harcourt Teaching Hospital where this study was conducted. Voluntary counselling and testing services are still at the most rudimentary stages of development in some few big centres. Moreover, the attitude of the average Nigerian to patients infected with the HIV virus is still largely negative [15]. Hence even the few that may already know their HIV-positive status may tend to conceal it.

The resultant effect of this scenario would be a large number of HIV-positive women going through pregnancy and delivery without the benefit of any intervention measures to reduce the risk of vertical transmission. Reported rates of transmission of HIV from Mother to child have ranged from around 10%-25% in Europe and the United States of America (USA) to 25% - 40% in some African and Asian studies [16,17]. Vertical transmission can occur in-utero, intra-partum or post-partum through breast-feeding, but the majority (60-70%) occur around the time of delivery [18,19]. Several risk factors associated with a high risk of MTCT have also been identified. These include vaginal delivery, breast-feeding, high maternal plasma viral load, ulcerative disease of the genital tract and genital tract infection [2]. Identification of these risk factors have led to successful development of several intervention measures aimed at reducing the risk of MTCT, including anti-retroviral therapy, vaginal cleansing with antiseptic solutions, caesarean delivery and denial of breast-feeding [2]. These measures have all proved useful in reducing vertical transmission to varying degrees.

Despite the application of universal safety precautions, a further implication of our results is that since most of these antenatal patients are unaware of their HIV status, they go into labour and are attended to at the delivery room in a routine manner, without any additional precautions. This practice could result into a higher risk of occupational exposure of labour room staff to HIV infection, further complicating the epidemiology and spread of HIV in our locality.

The results of this study further highlight the fact that most patients attending hospitals in Nigeria are usually not aware of their HIV status. Frequently, biological fluids from these patients are sent to the laboratories for clinical investigations, without identification or "flagging" of such specimens as HIV-positive. Therefore, laboratory staff and other health personnel who come in contact with these patients and their biological fluids in the course of their duty usually take no extra safety measures other than the routing universal safety precautions. This leads to increased risk of occupational exposure of the hospital staff to potentially infective material. We have previously reported an HIV- sero-positivity rate of 8.1% in all serum samples submitted to the Chemical Pathology laboratory of the University of Port Harcourt Teaching Hospital, where this study was also conducted [20]. The results of this study further corroborate our earlier findings and highlight the need for urgent policy measures to improve laboratory and work place safety in hospitals in sub-Saharan Africa. Surveys by the centrs for Disease Control, USA has shown that laboratory workers represent nearly one third (32%) of all cases of overt AIDS due to HIV infections received at work [21].

It has been pointed out that maternity services in areas of high HIV prevalence have several responsibilities [2]. Firstly, to enable women to be tested and to use these results to maintain their health in an optimal manner; secondly to utilize appropriate interventions to reduce the rate of mother to child transmission (MTCT) of HIV; and thirdly to train staff and provide equipment to prevent nosocomial transmission of HIV and other pathogens [22].

The results of this study highlight the urgent need for policy measures to be put in place to identify pregnant women who are sero-positive for HIV. It is suggested that these measures should include mandatory screening of all pregnant subjects in sub-saharan Africa for HIV infection, similar to the compulsory routine screening for syphilis during pregnancy. This would enable adequate counselling for all sero-positive cases during the antenatal period and also allow sufficient time for early institution of intervention measures to minimize the risk of MTCT. Such a policy would also reduce the risk of nosocomial transmission and occupational exposure of hospital staff to HIV infection.

Now is the time to take the bull by the horns, for as it has been pointed, out AIDS is no longer a time bomb waiting to go off. AIDS is here. AIDS is real. AIDS is devastating sub-Saharan Africa.

CONCLUSION

It is concluded that there is a relatively high sero-prevalence of HIV (7.3%) in pregnant women attending antenatal clinics in Port Harcourt, Nigeria. There is need for urgent policy measures, including routine screening of all pregnant women for HIV infection, in order to reduce vertical transmission, nosocomial transmission and occupational exposure of hospital staff to HIV infection.

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