

Seroprevalence Of HIV Infection Among Blood Donors In Port Harcourt, Nigeria

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ABSTRACT

Background: This study was undertaken to determine the seroprevalence of human immunodeficiency virus infection among blood donors living in the Niger Delta area of Nigeria.

Methods: A total of 1500 consecutive donors comprising 1481 males and 19 females were screened for HIV-I and HIV-II antibodies using the World Health Organization (WHO) approved Immunocomb HIV I and II test kit. All initially reactive samples were confirmed using the Genscreen HIV I and II test kit.

Results: The overall prevalence of HIV was 1.0%. The highest prevalence occurred in the 20 - 29 years age group (60%), followed by 30 - 39 years age group (21.5%). Commercial remunerated donors had the highest infection burden (1.4%) followed by the family replacement donors (0.7%) ($p < 0.05$). HIV-I accounted for the more predominant strain (0.8%).

Conclusion: This study has shown an overall prevalence of 1% among blood donors in the Niger Delta area of Nigeria with the highest prevalence amongst donors in the 20 to 29 years age group. We advocate for the mandatory screening of donor units intended for transfusion and the immediate take off of the national blood transfusion service. Furthermore, there is an urgent need for the health education of the people of the Niger Delta area on preventive measures aimed at arresting the spread of HIV.

KEYWORDS: Blood Donors; HIV; Niger Delta; Nigeria.

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INTRODUCTION

Blood transfusion in Nigeria currently poses interesting challenges. The advent of HIV has provoked a greatly heightened emphasis on safety with inescapable implications on complexity and cost. Globally, the epidemic of HIV/AIDS is worse than ever with an estimated 46 million living with HIV infection, with new infections occurring at about 5 million per year and over 3 million people dying of AIDS each year¹. The prevalence of HIV/AIDS in

Nigeria has been increasing steadily from 1.8% in 1991 to 3.8% in 1993, 4.5% in 1999, 5.8% in 2001 and declined to 5.0% in 2003².

Recent investigation in Port Harcourt shows a geometrically increasing prevalence, a higher HIV - I prevalence and a 1:1 male to female ratio³. An increasing seroprevalence from 2.8% in 1993⁴ to 5.5% in 2000⁵ was reported amongst blood donors in Maiduguri. Amadi *et al*⁶ in Aba obtained an HIV prevalence of 10.6% while Durosinmi *et al*⁷ in Ile-Ife observed 0.08% prevalence. Glynn *et al*⁸ in an analysis of data from 1.9 million volunteer blood donors in the United States from 1991 to 1996 observed a drop in HIV prevalence of first time donors from 0.03% to 0.015% over the period and a 2.92% prevalence per 100,000 donors per year. Carswell⁹ in Kampala, Uganda observed an HIV prevalence of 15.86% among healthy blood donors.

However, there is paucity of data on the prevalence of HIV among blood donors living in the Niger Delta area of Nigeria and the risk of transfusing untested blood in rural areas, where screening facilities are lacking, is high. Our present study is an effort to examine the sero-epidemiology of HIV, among blood donors in the Niger Delta area of Nigeria, describing in addition their demographic characteristics. It is also hoped that data obtained in this study would be utilized to evaluate the policy of exclusion of donor with surrogate markers for HIV.

MATERIALS AND METHOD

Study Population

A total of 1500 consecutive blood donors who came to the blood transfusion unit of the University of Port Harcourt Teaching Hospital to donate blood between January and April 2003 aged between 18-54 (mean age 29.70± 6.75) years constituted the subjects for this study. The donors were made up of 1481 males and 19 females. Commercial donors constituted 651(43.4%) of the study population while 849 (56.6%) were family replacement donors. Demographic data of age and sex and informed consent, were obtained from all donors.

Sample Collection

Five millilitres of whole venous blood were collected from each donor into plain tubes without

anticoagulants. Serum samples were extracted and tested for the presence of HIV I and II antibodies using the World Health Organization (WHO) approved Immunocomb HIV I and II test kit (Organics, Israel) an immunochromatographic test for the qualitative and differential diagnosis of HIV. All initially reactive samples were confirmed using the Genscreen HIV I and II test kit (Bio Rad, France) an enzyme immunoassay based kit for the detection of antibodies to HIV I and II. The manufacturers' standard operating procedures were strictly followed.

Statistical Methods

Data analysis was performed using a statistical package (Version 9 SPSS). Student t-test and chi-square test were used to assess the significance of differences among groups. In all cases a p-value of ≤ 0.05 was considered significant in all statistical comparisons.

RESULTS

Out of the 1 500 blood donors tested, 15/1500 (1.0%) were positive for HIV, out of which 12/1500 (0.8%) had HIV I, 2/1500 (0.1%) had HIV II, while 1/1500 (0.07%) had dual HIV I and II infection. The prevalence of HIV was relatively higher among female donors (5.3%) compared to males (1.0%) as shown in Table I. The highest infection burden occurred in the 20 - 29 years age group (60%) followed by the 30 - 39 years age group (21.5%) as shown in Figure 1.

The prevalence of HIV was highest among commercial remunerated donors 9/651 (1.4%) compared to family replacement donors 6/849 (0.7%) [p < 0.05] as shown in Table II. Majority of the commercial donors 361/651 (55.5%) and family replacement donors 665/849 (78.3%) were in the 20 - 29 years age group.

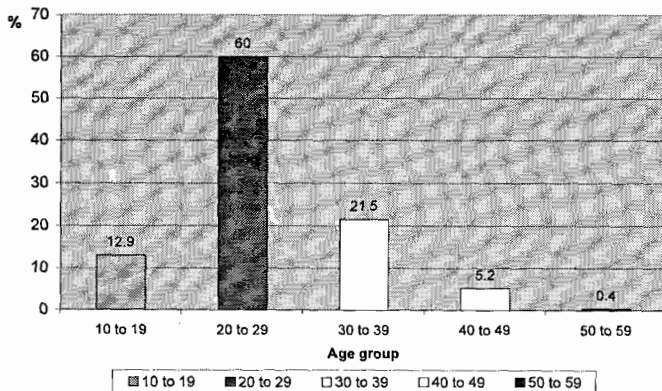


Figure 1. Age distribution of HIV blood donors

Table I. Sex distribution of HIV positive blood donors

Sex	Number Screened	Number HIV Positive	% HIV Positive
Male	1481	14	1.0
Female	19	1	5.3

Table II. Distribution of HIV positive donors based on status.

Donor Status	Number Screened	NUMBER HIV Positive	% Hiv Positive
Commercial Donors	651	9	1.4
Family Replacement Donors	849	6	0.7

DISCUSSION

The dual problems of HIV/AIDS are posing the most serious challenge to mankind and have remained a global public health problem. It is largely unknown to what extent HIV affects donors in many of the world's developing countries particularly in sub-Saharan Africa. Our study represents the first large-scale effort to examine the prevalence of HIV among blood donors in the Niger Delta area of Nigeria. In this present study, we observed an HIV prevalence of 1.0% among donors in the Niger Delta area of Nigeria. This value is however lower than the prevalence obtained by Baba *et al*⁵ and Harry *et al*⁴ in Maiduguri, Carswell⁹ in Kampala, Uganda and Amadi *et al*⁶ in Aba, but relatively higher than the prevalence obtained in Ile-Ife by Durosinmi *et al*⁷. The higher prevalence observed by Baba *et al* in Maiduguri and Carswell in Kampala, Uganda may be a reflection of a number of yet unidentified risk factors. Similarly the high prevalence obtained in Aba may have been due to the fact that this study was retrospective spanning a five year period, an indication that the same population of donors, particularly commercial remunerated donors, may have been screened repeatedly several times within the period thus resulting in a higher than expected prevalence.

Our finding of a significantly higher HIV prevalence among commercial remunerated blood donors and family replacement donors is consistent with the observation by the World Health Organization (WHO) that paid blood donors and family replacement donors are more likely to transmit transfusion transmissible infections (TTIs) than voluntary donors¹⁰. The higher prevalence observed among commercial donors compared to

family replacement donors in this study may have been due to the fact that paid donors often come from the poorest sector of society and may be poor in health. They may also be more likely to give blood more often than recommended, be undernourished and more at risk of having a transfusion-transmissible infection from high risk behaviors; intravenous drug use, involving sharing of needles, promiscuity and unprotected sexual intercourse. Family replacement donors may feel obliged to donate blood even if they know that they have some health condition, which prohibit donation of blood.

The observation of a high HIV prevalence among youths 20-29 years of age found in this study is at variance with previous report by Baba *et al*⁵ who found a high prevalence among youths below 20 years. This observation is ominous for the Nigerian nation if unchecked, since the economically viable aspect of our population (Youths) is worst hit by HIV. These are people the Nigerian society has invested so much in and at a time they are required to take up parenthood, socio-economic and political role, they come down with the disease, thus destabilizing the manpower base and indeed the fabric of society.

Our observation of a more predominant HIV-I infection and a lower HIV-II prevalence is consistent with observation from previous studies by Akinsete *et al*¹¹ and Ekweozor *et al*¹² who found HIV-I as the predominant viral type in Nigeria. The finding of a 1% HIV prevalence in this study constitutes further evidence of the risk of transfusing unscreened blood in Nigeria, considering the fact that most centers particularly in the rural areas of the Niger Delta do not have HIV screening facilities, coupled with the fact that electric power supply in most cases is not available, and when available is usually inadequate.

Since the guiding principles of blood transfusion is that it is beneficial and will not cause harm, we recommend that the National Blood Transfusion Service run on voluntarily donated blood be set up to address the acute shortages of blood and blood products¹³. This shortage puts most transfusion centers under pressure of collecting blood from paid and family replacement donors. We advocate that commercial remunerated donation be discouraged, that screening kits that require less sophisticated equipments and expertise be supplied regularly to rural and urban health facilities and that trained personnel be sent to manage HIV screening

facilities. We also recommend that a mandatory universal screening policy be instituted for HIV and other transfusion-transmissible infections¹⁴ and that antigen based kits (P24 antigen) be provided for transfusion centers to further increase the safety of blood transfusion by eliminating donors in the window period of HIV infection¹⁵. Educational campaigns should be intensified towards high-risk behavioral change, to stem the tide of a further spread of the virus.

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