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HIV Prevalence among Blood Donors in University of Maiduguri Teaching Hospital (UMTH): A Ten Year Experience

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Abstract: The trend of HIV seropositivity among blood donors at the UMTH is reported in this study for a ten-year period (1995-2004). Of an accumulative total of 15,898 blood donors screened, 634 (4.0%) had positive serologic tests for HIV infection. Male donors screened were 15,467, while females were 589. Of these, 3.8 and 10.4%, respectively tested HIV sero-positives. The percentage positivity among blood donors shows that donors aged 26-30 were 4.3% followed by 31-35 years age bracket (4.2%) while the least (3.9%) were in the age range 36-40. Findings in this study suggest that donors in the age bracket (16-35 years) seem to have a more consistent higher susceptibility to HIV infection over the years than those in the older age bracket of 36 and above. However, comparatively lower HIV prevalence in the younger age group of 16-20 could be an indication of a decline in the level of new infection, hence, heralds an encouraging trend. There is need for health managers and policy makers to introduce intervention measures that will drastically force down the epidemic in this locality. Moreso, as the majority of blood donors who provide blood are recruited from the sexually active age bracket during routine and emergency periods for life saving purposes.

Key words: HIV prevalence, blood donors, Maiduguri

Introduction

The acquired immunodeficiency syndrome (AIDS) was discovered in 1981, in the United States of America among Homosexual patients and since then it has remained a big challenge to medicine (Gottlieb *et al.*, 1981; Centers for Disease Control, 1981).

Human Immunodeficiency Virus (HIV)/AIDS has resulted in the death of over 20 million persons throughout the world and is the leading cause of death among persons 15-59 years of age. Approximately 40 million people are estimated to be living with HIV infection (UNAIDS, 2004).

Two decades into the discovery of HIV/AIDS in Nigeria, despite all preventive measures HIV/AIDS has continued to increase exponentially (NACA, 2005). Nigeria is now a focal point of HIV infection in sub-Saharan Africa with a national sero-prevalence rate rising from 1.8% in 1991 to 3.8% in 1993; 4.5% in 1995 and 5.8% in 2001 then decline to 5.0% in 2003 (NACA, 2005).

The transmission mechanism of HIV was first described in 1984 a year after HIV was isolated and since then cure for AIDS has remained a miracle (Gallo *et al.*, 1984; Levy *et al.*, 1984).

Apart from the sexual route of HIV transmission which is most incriminated in Nigeria and other parts of Africa, blood and blood product transfusions, organ and tissue transplants from infected

individuals and vertical transmission from mother to child (Vogt *et al.*, 1986; Wofsy *et al.*, 1986) have also become a problem. Since there is no curative treatment for AIDS, emphasis has been placed on prevention of infection and transmission. With the advent of HIV/AIDS in the 1980s different preventive approaches have been employed with respect to the prevailing route of transmission in a particular environment. Essentially in places such as health facilities with blood banking services, one of the major efforts in the prevention of HIV transmission is the mandatory pre-screening of blood and blood products for HIV and other infectious diseases before transfusion.

This has greatly reduced the risk of acquiring HIV through a blood transfusion (Schreiber *et al.*, 1996; Regan *et al.*, 2000).

The trend of HIV seropositivity among blood donors at the UMTH for a ten-year period (1995-2004) is reported in this study.

Materials and Methods

Study Population

A total of 15,898 donors visited the Blood Banking unit of the University of Maiduguri Teaching Hospital (UMTH), Maiduguri between 1st January 1995 to 31st December 2004 for purpose of blood donation. They were 15,467 males and 431 females with age ranges from 16 to 55 years. The categories of donors in this study include relatives or friends of patients who required blood transfusion and commercial donors. UMTH is a tertiary health center located in Maiduguri, a cosmopolitan city and capital of Borno state. Immigrant patients and blood donors from the neighbouring countries of Chad, Cameroon and Niger similarly visit the hospital. Such donors are also accounted for in this study.

In tune with the hospital blood banking policy, all blood samples donated for transfusion purposes are screened for HIV and some other transmissible viral infections prior to use.

HIV Antibody Test

Five millimeters of blood were collected from each donor by venipuncture and dispensed into a clean sterile container. Blood was allowed to clot and centrifuge at 1000 X g for 10 min and serum aspirated into a clean labeled sterile container. HIV screening was carried out using the following test kits: Welcozyme HIV kit (Wellcome Diagnostic, Darford England), Genscreen Plus HIV Ag-Ab Kit (Bio-rad, France) and Enzyme Immuno Assay (EIA) Determine HIV rapid Kit (Bio Rad, France). Positive donor samples were discarded at first screening.

Data Analysis

Analysis of data for linear trend was done using Epi info vs 6.04. Chi square test was used to test for level of significance at $p \leq 0.05$.

Results

Out of an accumulative total of 15,898 blood donors screened 634 (4.0%) had positive serologic tests for HIV infection. Table 1 shows that the highest prevalence of 9% occurred in 1995 and 1997. Between 1998-2004 the prevalence plateau at average of 3.3%. The percentage positivity between the years under review was highly significant ($p < 0.01$).

Of the 15,467 male donors screened, 3.8% were HIV sero-positive whereas 10.4% of the females ($n = 589$) were sero-positive. No significant association was observed among the gender groups within the entire period of study ($p < 0.05$) (Table 2).

The age distribution and percentage positivity among blood donors (Table 3) shows that donors aged 26-30 years was 4.3% followed by 31-35 years (4.2%) while the least (3.9%) was in the age range 36-40 years. Chi square analysis indicates a significant association between the different age groups.

Table 1: Yearly distribution of percentage positivity among blood donors in UMTH (1995-2004)

Years	No. screened	No. HIV positive	Percentage positive
1995	1098	93	9.0
1996	1234	58	5.0
1997	982	88	9.0
1998	1112	39	3.5
1999	1015	27	3.0
2000	1474	51	4.0
2001	1988	52	3.0
2002	2468	77	3.1
2003	2438	83	3.4
2004	2089	66	3.2
Total	15,898	634	4.0

Table 2: Sex distribution and percentage positivity among blood donors (1995-2004)

Years	Sex of donors		No. HIV positive		Percentage positive	
	Male	Female	Male	Female	Male	Female
1995	1091	7	89	4	8.2	57.1
1996	1228	6	56	2	5.0	33.3
1997	956	26	79	9	8.3	35.0
1998	1097	15	35	4	3.1	27.0
1999	985	30	22	5	2.2	17.0
2000	1455	19	48	3	3.3	16.0
2001	1943	45	50	2	3.0	4.4
2002	2369	99	69	8	3.0	8.1
2003	2351	87	78	5	3.3	6.1
2004	1992	97	63	3	3.2	3.1
Total	15,467	431	589	45	3.8	10.4

Table 3: Age distribution and percentage positivity among blood donors (1995-2004)

Age group (Years)	No. screened (n = 15,898)	No. HIV positive (n = 634)	Percentage positive
16-20	832	27	3.2
21-25	2630	102	3.8
26-30	4203	182	4.3
31-35	3666	153	4.2
36-40	3014	118	3.9
>41	1553	52	3.3

Table 4: Age and sex distribution and HIV percentage positivity

Age group (Years)	Males		Females	
	No. screened	No. positive (%)	No. screened	No. positive (%)
16-20	782	26(3.3)	50	1(2.0)
21-25	2512	88(3.5)	118	14(11.8)
26-30	4086	162(4.0)	117	20(17.1)
31-35	3593	148(4.1)	73	5(6.8)
36-40	2972	114(3.1)	42	4(9.5)
≥41	1522	51(3.4)	31	1(3.2)
Total	15,467	589(3.8)	431	45(10.4)

Table 4 shows that more males within the age range 31-35 years had the highest percentage positivity (4.1%) followed closely by those in the age range 26-30 years (4.0%). However, female donors in the age ranges 26-30 years and 21-25 years had percentage positivity of 17.1 and 11.8%, respectively. In both gender groups, donors in the age range 16-20 years were least infected (males 3.3% and female 2.0%).

A graphical presentation (Fig. 1) of age specific prevalence between donors in the younger age bracket, 16-35 years and the older age bracket, 36-55 years shows a rhythmic trend of HIV positivity

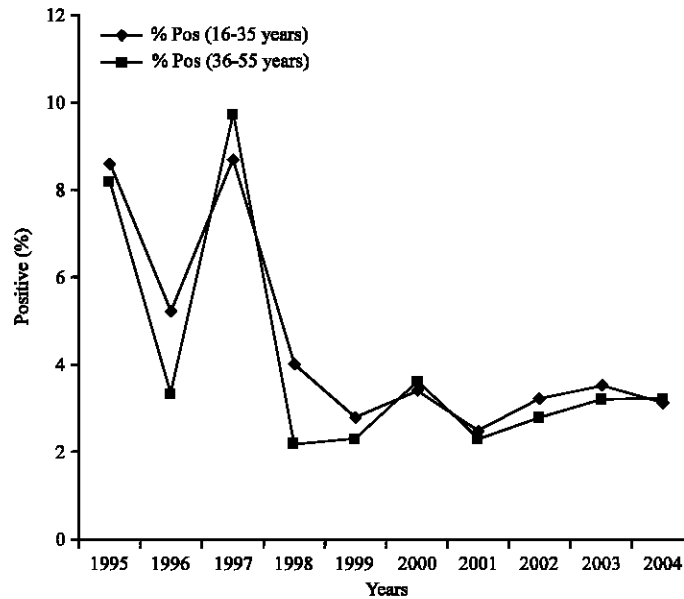


Fig. 1: Age specific prevalence of HIV positive blood donors

within the review period as well as in the two age brackets examined. However, donors in the younger age bracket (16-35 years) seem to have a more consistent higher susceptibility to HIV infection over the years than those in the older age bracket of 36 and above.

Discussion

The importance of screening blood for HIV and other transmissible infection among blood donors before transfusion can neither be underestimated nor over emphasized. Blood administered as therapeutics need to be safe so as provide the required improvement to human life (Klein, 1995). All health facilities, public and private, must be made to know the implication of transfusing contaminated blood to patients. Screening of donor blood for all known potential infectious diseases that can be transmitted through blood transfusions is not practically feasible. However, it is mandatory to screen for HIV being one of the important infectious agents that can cause great devastation if contaminated blood is transfused to patients.

The result of this study shows that HIV prevalence among blood donors in the early 1990s in Maiduguri were about three times higher than prevalence in the late 1990s and up to the end of the period under review (Harry *et al.*, 1993). This observation could be attributed to the intensified awareness campaign and preventive measures put in place in Borno state as from the late 1990s. The activities of relevant non-governmental organizations also increased within the said period to complement government efforts in stemming the spread of HIV infection in the state. Donor selection strategies adopted in the UMTH within the said period might also be responsible for the consistent low HIV positivity rate among the blood donors. This include emphasis on patient relative donation, discouraging commercial donors, encouraging autologous donation especially for patients on elective surgery, etc.

Findings in this study indicate a higher prevalence of HIV infection among blood donors in Maiduguri in 2004 when compared with reports from Ile-Ife, southwest (0.08%) (Durosinmi *et al.*, 1992) and Portharcourt, Southsouth (1.4%) of Nigeria (Ejele *et al.*, 2005). When compared with

prevalence reported in developed countries such as United States (2.92%) in 2003 (Glynn *et al.*, 2000) where multi-sociocultural factors and lifestyle are responsible for increase prevalence, result from this study indicates could reflect a deviation from the usual route of transmission reported among Nigerians. In Maiduguri, the general factors that drive the epidemic still persist. Such include poverty; low socio-economic status of women and concomitant lack of empowerment of women and girls; moral and social beliefs that shape sexual behaviour like use of condom, ignorance, etc; low literacy and mode of spread of HIV/AIDS. The activities of local roadside manicurist and pedicurist abound while stigma and discrimination has driven the epidemic underground resulting in reluctance of people to check their status. Therefore, there is need for a large scale longitudinal epidemiological study among Maiduguri inhabitants to adequately address the problem of relative high prevalence observed in this study. Another factor advanced for the high prevalence is the fact that polygamy as practiced in Maiduguri promote sexual practices that put women and men at risk of contracting HIV even in stable relationships (NACA, 2005).

There was no significant difference in HIV prevalence observed between Males and Females in this study. However, the high percentages observed among female donors could be attributed to the small number of females that were involved in blood donation in this locality. This is in consonance with observations reported by Rukunbo *et al.* (1997), Ejele *et al.* (2005) and the reason for this indifference toward blood donation among women could be attributed to their phobia to blood donation. With respect to age groups, no significant difference was observed with HIV infection among the various age groups studied. The lowest percentage prevalence was observed in the 16-20 years age group while the highest prevalence of 4.3% was observed in the 26-30 years range followed by the 31-36 years age range with 4.2%. The age group of 26-35 years represents the sexually active age bracket. HIV prevalence in the younger age group of 16-20 could be an indication of a decline in the level of new infection, hence, heralds an encouraging trend. Similar, findings were reported in the national sentinel surveillance report among antenatal clinic attendees (NACA, 2005).

The challenge to guarantee safer sex among the sexually active individuals in Maiduguri and beyond is a task that must be taken seriously if the fight against HIV/AIDS is to be won. There is need to intensify campaigns on behavioural change using appropriate materials to communicate and promote abstinence among young people while guided messages on condom use as protective barrier for die hard individuals are also important to provide protection as reported elsewhere (Nigerian Radio Campaign Generates safe Behaviour, 2003).

In conclusion, the declining trend of HIV infection in Maiduguri among blood donors who are apparently healthy individuals over the years, compared favourably with the levels reported in the national survey. The consistent prevalence of HIV infection at less than 4.0% over the years require serious attention among health planners and policy makers at this time in order to drastically force down the epidemic. Moreso, as the sexually active age bracket continues to form the majority of blood donors who provide the much needed blood either as friends relatives of patients or as commercial donors during routine and emergency periods for life saving purposes.

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