

# Demographic and Laboratory Evidence of Non Sexual Transmission of HIV in Nigeria

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## Summary

Apart from heterosexual transmission, not much is known about the contribution of the other modes of spread of HIV in Africa. To evaluate the importance of non-sexual/non-vertical transmission in adults and children in Nigeria, data from mother-child pairs (community and hospital) and a community HIV surveillance among adult populations in two communities of Oyo State in SW Nigeria were analysed. In the community-based mother-child pair HIV testing, 18 of 476 (3.8%) under 5 years children were positive for HIV antibodies with only one positive mother-child pair. In the hospital surveillance (1996-1997) 10(7.0%) children of 132 mother-child pairs were positive while three (30%) of the 10 mothers were HIV negative. Similarly, 5(10%) of the mothers of 10 HIV positive children (2004) were HIV negative. In another community study, 5(13.2%) of the 38 adults from Ibadan and 12(4.8%) of 251 from Saki who claimed they never had sexual experience were HIV positive. Use of contaminated instruments and blood transfusion remain important routes of transmission of HIV in Nigeria.

## Introduction

The impact of the HIV/AIDS epidemic has been felt greatest in the sub-Saharan Africa where over 70% of infected individuals reside<sup>1</sup>. In Nigeria, the rate of infection continues to rise despite effort to curtail

the spread of the virus. The latest national high risk survey in the country shows a prevalence rate of 17% and 11% among PTB and STD patients respectively <sup>2</sup>, while the median rate among antenatal clinic attendees in 2001 was 5.8% <sup>3</sup>.

Heterosexual route and MTCT have been shown to be the predominant modes of spread of HIV among the adults and children respectively in Africa <sup>4,5</sup>. However, the risk of acquiring HIV infection through blood and blood products is expected to increase in the phase of the rising rate of HIV infection in the population. In most African countries a lot of prevention strategies efforts have been in the area of sexual transmission. On the other hand, very little is done about non-sexual/MTCT modes of HIV transmission in the region <sup>6,7</sup>. Transmission of HIV through blood and blood products is becoming significant in the region in view of the recent reports from many developing countries indicating high rate of unsafe injections <sup>8</sup>.

In this report, we present evidence of high rate of non-heterosexual transmission of HIV in Nigeria.

## Materials and Methods

### *Subjects and study area*

Subjects included 143 under five years old children with protein energy malnutrition (PEM) identified in a prospective study between May 1996 and June 1997 at the University College Hospital (UCH), Ibadan; 220 under five children attending the Baptist Medical Centre Saki between January and May 2004 medical problem or immunization and their mothers. Blood samples from 476 mother-child pairs collected initially for a community based Vitamin A survey were also included in the study. In addition, samples from 2767 individuals who participated in a cross-sectional HIV second generation surveillance in nine adult population groups from two communities in southwest Nigeria were included.

Samples were collected only from consenting adults or mothers in case of children. Protocols for both the hospital and community based studies were approved by the UCH/University of Ibadan institutional ethical review committee. Demographic and other necessary information including transfusion history among children and sexual history from adults were collected at the time of blood collection.

### *Sample Collection, Processing and Testing*

About 2ml of blood sample was collected from children while 5mls was collected from adults into a tube containing EDTA. Plasma was separated and stored at -20°C until tested. All the plasma samples were initially tested for presence of HIV antibodies by ELISA (Sanofi Pas-

teur, France) while specificity of antibodies in all the ELISA reactive samples were confirmed by Western blotting (Biorad, France). Data was analysed using Epi Info version 6.0.

## Results

Eighteen of the 476 (3.8%) under 5-children from the community-based mother-child pair survey in 1996/1997 were confirmed positive for HIV-1 infection. Only one (5.6%) of the 18 positive children had a HIV positive mother, giving a discordant rate of 94.4%. Among the individuals enrolled in the hospital based study, discordant rates of 30% and 50% were observed in the samples collected in 1996/97 and 2004 respectively (Table 1). Only two and one of the children in the hospital and community-based studies respectively had a history of blood transfusion.

Sixty-eight (5%) of the 763 and 251 (13%) of 1753 of individuals in Ibadan and Saki respectively who participated in the adult second generation surveillance claimed not to have had sexual experience. Overall, a HIV infection rate of 5.9% was observed among those who had never had sex (Table 2). The rate however varied between Ibadan (13.2%) and Saki (4.8%). Table 3 shows the proportion of individuals at the different age groups who have had sexual experience among the study par-

TABLE 3: DISTRIBUTION OF SUBJECTS WHO HAVE EVER HAD SEX BY AGE CATEGORY AND GENDER IN TWO COMMUNITIES (IBADAN AND SAKI) NIGERIA

TYPE OF STUDY	HIV STATUS	YEAR			
		1996-1997		2004 (JANUARY - MAY)	
		CHILD		CHILD	
		+ve	-ve	+ve	-ve
COMMUNITY BASED	MOTHER +	1	19	Not Done	
	MOTHER -ve	17	423	Not Done	
HOSPITAL BASED	MOTHER +	7	1	5	5
	MOTHER -ve	3	121	5	210

TABLE 2: HIV INFECTION AND SEXUAL EXPERIENCE OF RESPONDENTS IN TWO COMMUNITIES IN OYO STATE, NIGERIA

SEXUAL EXPERIENCE	IBADAN		SAKI		TOTAL	
	N	N (%) HIV POSITIVE	N	N (%) HIV POSITIVE	N	N (%) HIV POSITIVE
YES	725	58(7.6)	1753	166(8.3)	2478	224(8.1)
NO	38	5(13.2)	251	12(4.8)	289	17(5.9)
TOTAL	763	63(8.3)	2004	178(8.9)	2767	241(8.7)

TABLE 1: HIV INFECTION DISCORDANCE AMONG MOTHER-CHILD PAIRS IN SOUTHWESTERN NIGERIA

AGE GROUPS (YEARS)	FEMALE		MALE		TOTAL	
	NT	N(%)EVER HAD SEX	NT	N(%)EVER HAD SEX	NT	N(%)EVER HAD SEX
<20	322	193(59.9)	147	79(53.7)	473	276(58.4)
20-24	204	169(80.1)	145	121(83.4)	356	297(83.4)
25-29	186	179(96.2)	293	278(94.9)	500	478(95.6)
30-39	302	300(99.3)	401	398(99.3)	715	710(99.3)
40-49	164	163(99.4)	264	262(99.2)	429	426(99.3)
>50	106	105(99.1)	232	231(99.6)	339	337(99.4)
TOTAL	1284	1109(86.4)	1482	1369(92.4)	2812	2524(89.8)

ticipants. The exposure was lowest among the individuals under 20 years and increased with age of respondents.

## Discussion

The high rate of mother-child HIV discordance observed in both the community (94.4%) and hospital (30 – 50%) based studies presented in this report shows the importance of non vertical transmission of the infection among the paediatric population in Nigeria. Earlier studies on paediatric HIV infection in Nigeria have suggested varied rate of non vertical transmission in the country. As observed in this study, rate of blood transfusion associated HIV infection reported among children by previous workers in the country also varied widely ranging from 8.9% to 68%<sup>9, 10, 11</sup>. This situation coupled with high rate of infection in the adult population can partly explain the reported increasing rate of paediatric HIV infection in recent years in Nigeria<sup>12, 13</sup>. In addition, certain traditional practices associated with continuous usage of unsterilized instruments and cross contamination with blood and other body fluids have been associated with transmission of HIV in the country<sup>14</sup>.

Only two (25%) of the HIV positive children with seronegative mothers in this study had a history of blood transfusion. This rate is by far lower than earlier report by Emodi and Okafor<sup>9</sup> in which 68% of 83 HIV infected children were associated with exposure through blood transfusion in eastern Nigeria. However, the high rate of multiple episodes of injections especially in non-government approved medical facilities is an indication of the grave risk constituted by non-sexual/MTCT route in the spread of HIV infection in the country. Earlier reports from Romania incriminated the use of contaminated needles as vector for the spread of HIV-1 among hospitalized patients children<sup>15</sup>. Other risky practices that may also promote the spread of HIV among the paediatric population need to be properly investigated and documented for appropriate intervention strategies.

Furthermore, analysis of data from community based second genera-

tion survey among adult population in this study showed that only 5% of the 7631 in Ibadan and 13% of the 1753 from Saki claimed not to have ever had sex. The inverse relation of sexual exposure and age is in line with what is expected in any community. The relatively high rate (13.2%) of HIV infection in Ibadan and 4.8% in Saki observed among these individuals is suggestive of the importance of non-sexual mode of transmission of the virus even among the adult population in Nigeria.

## Conclusion

Use of contaminated instruments such as injection syringes and needles, traditional surgical materials and blood transfusion remain important routes of transmission of HIV in Nigeria. The urgent need to educate health workers and the general public on this preventable hazard can not be overemphasized.

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