HIV Prevalence in Vulnerable Children Living in Jos, Plateau State, North-Central Nigeria

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Abstract: *Background*: The lack of Parental supervision, including psycho social problems and decrease access to basic needs such as food, shelter, clothing, education and health care are examples of the enormous challenges faced by Vulnerable children (VC). These challenges pushes VC to adopt survival and coping strategies, of which some are exposure variables of sexually transmitted infection including HIV infection. In addition, some of these children were orphaned and made vulnerable by HIV. As such, VC should benefit from a health provider initiated counseling and testing for HIV as recommended by the Nigerian HIV policy. However, focus on screening VC for HIV infection has been abysmal; it is on this premise that this study set out to determine the HIV prevalence of vulnerable children in Jos, Nigeria.

Methods: Vulnerable children were sampled from 3 different institutions and from households in 3 different communities in Jos, Plateau State with the assistance of Non-Governmental organizations involved in the care of VC. All VC enrolled were interviewed, clinically examined and screened for HIV based on national protocol and standard. Data generated were analyzed using CDC epi info version 7. A p value less than 0.05 was considered statistically significant.

Results: Out of the 237 children enrolled 145 (61.2%) were male VC while 92(38.8%) were female vulnerable children, giving a male female ratio of 1.0: 0.6. HIV sero - positivity was identified in 9 of the 237 VC giving a prevalence of 3.8%, amongst the study subjects. Out of the 9 HIV positive VC, 7 VC (77.8%) were resident in institutions; only two household VC were HIV positive. There was no statistically significant association between place of residence, age of VC, gender and type of vulnerability and HIV status among the studied population.

Conclusion: The HIV prevalence of 3.8% in vulnerable children is enormous and appears to be higher amongst children resident in orphanages than those in household.

Keywords: Vulnerable children, HIV, AIDS, orphans, Jos.

INTRODUCTION

At the outset of the Human Immune Deficiency Virus (HIV) epidemic, children affected by HIV were referred to as AIDS (Acquired Immune Deficiency Syndrome) orphans; the term “AIDS orphan” was later replaced by the term “Orphans and Vulnerable Children” (OVC) which had better social acceptance [1, 2]. In 2007, USAID suggested a newer term “Highly Vulnerable Children” because it encompasses other causes of orphan hood and vulnerability aside from HIV [3]. In Nigeria an orphan and vulnerable child is define as any child less than 18 years who has loss mother, father or both; or a child who lacks adequate access to education, health and other social support; or a child who lives in a house with terminally or chronically ill parent(s) or caregiver(s), old/frail grandparents(s) or caregiver(s). A child who lives outside of family care for example in an institution or on the street or a child who is infected with HIV/AIDS is olso considered a VC [2].

About 143 million orphans exist globally (2010 estimates), Nigeria is estimate to have 10 million orphans (2010 estimates) or an orphan prevalence of 10%; this is a significant increase compared to prevalence of 2% before HIV was discovered [2]. In Plateau state, the magnitude of the problem is likely to be higher than this national value because of the frequent communal crises in the state, that have led to the death and displacement of a lot of persons in the last ten years [4]. In addition, a high sero prevalence of HIV infection among the Nigerian adult population has been reported in various sentinel surveys; 11.3% in 2001, 7.7% in 2003 5.5% in 2005 and 7.7% in 2010.[4] These surveys are based on HIV assays that measure antibodies to specific antigens on the HIV virus and are therefore referred to has sero prevalence [5].

This group of children face same challenges of child survival as other Nigerian children, but may experience more challenges due to their vulnerability. For instance the absence of their parents (their primary care giver and first line of physical and social defense) has adverse consequences on the age of onset of sexual activity, exposure to sexual abuse, sexual exploitation and commercial sex activity [6-10]. These may be precipitated by the increased economic need, peer pressure, lack of supervision, exploitation, lack of education or information about HIV/AID [7, 8].

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Furthermore, the inability of VC to access and procure standard health services, further heighten the risk of acquiring HIV infection [8, 9]. No wonder the first case of HIV in Nigeria was reported in a 13 year old vulnerable girl (Hawker) who was diagnosed in 1987, three years after the historical independent isolation of the virus by Robert Gallo and Barre sinoussi [2, 11, 12].

Early diagnosis and initiation of treatment is a vital step towards effective and efficient management of children with HIV because of the rapid progression of the disease in children due to the immaturity of the immune system [13]. Even though the national program on HIV has been widely recommended, the lack of routine HIV screening among vulnerable children may not only worsen the epidemic but also delay the initiation of life saving therapeutic services usually offered at no cost by the federal Government of Nigeria and other donor agencies [13]. It is therefore not surprising that the national policy on Paediatric HIV/AIDS recommends a health provider initiated Counseling and testing for HIV amongst target children populations [13].

One of such high risk population that should be targeted is the VC, they are largely invisible and may have little or no access to health services that offer Voluntary counseling and Testing for HIV infection. It is on this premise that this study set out to determine the Sero -prevalence of HIV in Vulnerable children in Jos, North-Central Nigeria.

METHODOLOGY

Study Area

The study was conducted in Jos South, Jos North and Jos East Local Government Areas (LGA) in Plateau state, Nigeria. The three LGA's are all highland areas with rocky terrain and similar climatic condition, Majority of its inhabitant are civil servants, farmers and traders [15].

Study Subjects

The study subjects were vulnerable children who were resident in either a household or an orphanage within the study area. A child was included into the study if he or she was less than 18 years but greater or equal to 5years and was either an orphan (a child who has lost either one or both of his/her parents) or lives in a household where at least one adult was seriously ill for at least 3 months in the previous 12 months or children who were living in orphanages.

This study was a cross –sectional study of the selected communities and orphanages.

Sample Size

Using the formula for estimation of sample size in a prevalence study the minimum number of subjects needed to be studied was determined as follows [16]:

$$S = \frac{Z^2_{1-\alpha} P(1-P)}{d^2}$$

Where

S = sample size for infinite population

P = Prevalence = 0.18 [17]

α = level of significance, 5% (p = 0.05)

$Z_{1-\alpha}$ = Standard normal deviates for 95% confidence interval = 1.96

d = margin of error tolerable, 5% (d= 0.05)

Therefore S = $\frac{1.96^2 \times 0.18 \times 0.82.}{0.05^2}$ =227

Therefore the minimum sample size **S** was 227

Sampling Technique

A multistage sampling technique was used. In the first stage, out of the 17 LGAs in Plateau state, 3 (Jos North, South and East) were purposively selected since they are metropolitan and likely to have more OVCs. In stage two, the wards were selected from each of the LGAs, while in stage three, Proportionate sampling was done; Three orphanages to represent institutional OVCs and communities to represent those in homes. In each community and institution, simple random sampling was used to sample individual orphans into the study.

Institutional VC were sampled from 3 orphanages namely Our Lady of Apostle (OLA) orphanage, Gidan Bege orphanage and Gidan Kauna where 137 VC were sampled using simple random sampling to participate in the study.

Three Non-Governmental Organization caring for VC were used as contact to households with VC in three sub- urban communities namely Tanchol, Sabon Fobur and Mado village located in Jos south, Jos- east, and Jos- north LGA respectively.

Data Collection: was done using a pretested structured interviewer administered questionnaire.

Data collection: The Information generated included demographic and social variables. The height and weight of each child was assessed using a Healthline® weighing scale and stadiometer using standard protocols.

Procedure for HIV Testing

Blood samples were collected from each patient by the investigator and a trained assistant from the thumb after disinfection of the site with 70% alcohol. Fifty micro liter of blood was collected using a capillary tube (manufacturer specific) after a prick with a sterile lancet. The sample was then place on the filter end of the determine HIV-1/2 **R** test strip as instructed by the manufacturers. One drop of determine chase buffer was then added to the sample and the result was read after fifteen minutes. For every positive result another rapid test (Unigold**R**) was repeated [14].

Result Interpretation

A negative result showed only one bar on the control panel while a positive result showed two bars. Two positive results were considered as sero diagnosis of HIV. One positive result with one negative result will be tested by a third method starpark**R** [14].

Pretest strip verification: For every new pack of HIV1/2 rapid diagnostic kit two test strips was randomly selected and tested with pretest serum (one HIV positive and one HIV negative) to detect any manufacturing error [14].

Ethical Issues

Ethical clearance was obtained from the Jos University Teaching Hospital (JUTH) Ethical Committee before the study commenced. Written informed consent was obtained from the parents/caregivers of each child (in form of a signature or a thumb print). The essence and contents of the study was explained to each caregiver and to the child in a way he/she can understand. Pre and post test counseling's were done by the researcher or either of four trained research assistants.

Data Analysis

The HIV status and other generated data were analyzed using EPI Info version 7 CDC software. Categorical variables such as orphan status, age group, gender, place of residence and HIV status were described using proportion, while continuous variable were described using means, median and mode. Socio-demographic variables were compared with the dependent variable HIV status using bivariate analysis. In all statistical test $p < 0.05$ was considered statistically significant.

RESULTS

Out of the 237 vulnerable children analyzed 137(57.8%) were enrolled from 3 institutions while a 100 (42.7%) household VC were enrolled from 3 communities in Jos. There were 145 (61.2%) male VC in the study compared to 92 (38.8%) female vulnerable children, giving a male female ratio of 1.0: 0.63. The age range of the study population was 5-18 years, with a mean age of 13 $\pm$ 3.5 years and a median and modal age of 14 and 13.8 years respectively. Of the 237 VC studied 199 were orphans and 38 were vulnerable children; all institutional VC were cared for by orphanage staff while care givers of house hold vulnerable children are shown in Table **1**.

Table 1: Socio-Demographic Characteristics of the Sample Population (N=237)

	Frequency	Percentages
Gender		
Females	145	61.2%
Males	92	38.8%
Age group		
School age (5-10)	175	73.8%
Adolescent (11-18)	62	26.2%
Residence		
House hold	100	42.8%
Institution	137	57.8%
VC Type		
Non-Orphan	38	16.0%
Orphans	199	84.0%
Caregivers		
Orphanage	137	57.8%
Mother	50	21.1%
Father	4	1.7%
Grandparents	11	4.6%
Uncle	17	7.2%
Aunt	10	4.2%
Non-relatives	8	3.4%

Table 2: Socio-Demographic Characteristics of the Sample Population and HIV Status

	N	HIV Positive	HIV Negative	*p*	
Gender					
Females	145	5	140	0.13	0.72
Males	92	4	88		
Age group					
School age (5-10)	175	6	169		
Adolescent (10-18)	62	3	59	0.12	0.91
Residence					
House hold	100	2	98		
Institution	137	7	130	0.80	0.40
VC Type					
Non-Orphan	38	1	37		
Orphans	199	8	191	0.02	0.95

HIV sero - positivity was identified in 9 of the 237 VC giving a prevalence of 3.8%, amongst the study subjects. Out of the 9 HIV sero positive vulnerable children 7 VC (77.8%) were resident in institutions; only two household VC were sero positive. There was no statistically significant association between place of residence and HIV status of the studied population (p=0.40). See Table **2**.

Eight of the vulnerable children with HIV infection were orphans while one of the infected children was a vulnerable child. There were five HIV infected double orphan compared with only 3 HIV infected single orphans. There was no statistically significant association between type of vulnerable children and HIV status of the studied population (p=0.95) (See Table **2**).

The distribution of HIV infection based on sex was highest in girls where 5 VC where infected compared to 4 boys. The difference in HIV status based on gender showed no statistical significance (p= 0.) (Table **2**).

Only Vulnerable children age 5-15 years accounted for all the HIV positive cases. Three of HIV positive Vulnerable children were aged 10 years, 2 cases were aged 5 years while 8, 12, and 14 years had a case each. Even though majority of HIV cases were between ages 5-10 years, there was no significant statically difference between age group and HIV status amongst the study population. (p=0.91) (Table **2**).

All VC diagnosed with HIV where already receiving antiretroviral therapy from different institutions, with a CD4 count ranging between 300 to 1120 cell/micro liters.

Clinically two vulnerable children had skin lesions: generalized plain wart, and tinea capitis. Only one of HIV infected vulnerable children had hepato-megally, none had splenomegally. Only one VC had WAZ score less than -2SD, 3 of children had HAZ that was < -2SD.

DISCUSSION

HIV is one of the public health and developmental challenges facing sub Saharan Africa including Jos, Plateau state of Nigeria. The magnitude of HIV infection in children who are vulnerable either due to orphan-hood or other reasons in this current study was 3.8%. This is nearly equal to the adult HIV prevalence 4.8% reported amongst adult in the same location [18]. This study reveals that the magnitude of HIV infection in vulnerable children is enormous.

The HIV sero-prevalance of children living in other orphanages across Nigeria, as been reported as 1.1% in Oyo state Southwestern Nigerian by Oladukun *et al*. and 0.6% by Oluboyo *et al*. in Anambara state, South eastern Nigeria [19, 20]. These figures are comparatively lower than our studies and reasons for these include the fact that our study included both institutional and household VC; in addition to the variability of incidence within adult population by states within Nigeria as pediatric HIV infections may reflect the adult burden of the diseases. Ogbau *et al*. in two local governments in Anambara state reported a prevalence of 9.2% amongst orphans exposed to

sexual violence and children of infected parent/caregivers (65% HIV prevalence) [21]. A similar high prevalence of HIV in areas of high adult HIV prevalence has been reported by Gregson *et al*. in female Zimbabwean teens and amongst early adolescence in Masaka Uganda [22]. Other variables may include orphanages policy on admission of HIV infected children. While the orphanage in Ibadan, Oyo state had policy restriction on admitting HIV infected children those in our study area did not have such restrictions [19].

One of the strength of this study is that VC was sampled from both Institution and Household. The number of VC with HIV infection was higher amongst the household VC but no statistical difference was noted. This finding may suggest a drift of HIV positive VC towards the orphanages away from familiar household or maybe as a result of sampling bias. Whatever the basis this need to be further investigated.

This study enrolled children aged 5-18 years excluding all the under fives which may represent a higher proportion of children with vertical transmission of HIV this may explained part of reason why the HIV prevalence was lower than a previous study done in plateau state by Plateau Agency for the Control of AIDS (PLACA) which had earlier reported a prevalence of 18% [17].

There was no difference between male and female VC, studies in Port Harcourt south Nigeria, Kano, North western, Ibadan south western Nigeria have shown an almost equal proportion of male to female HIV infection [23-25]. This contrasts to what is obtainable in adult population were the female gender is more at risk for biological and socio cultural reasons [14].

CONCLUSION

The HIV prevalence of 3.8% in this study among the studied population should not be overlooked; it is a potential hot point for future outbreak.

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