

## THE PATTERN OF PAEDIATRIC HIV/AIDS AS SEEN AT THE NATIONAL HOSPITAL ABUJA NIGERIA

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### ABSTRACT

**Background:** Paediatric HIV/AIDS has become a significant cause of mortality and morbidity in our environment.

**Objectives:** The objective of this paper is to determine the mode of transmission, clinical presentations and outcome of hospital admissions in children with Paediatric HIV/AIDS at the National Hospital Abuja Nigeria.

**Methods:** A retrospective study of children with Paediatric HIV/AIDS admitted into the hospital from January December 2000 was done. Screening for HIV infection was based on clinical criteria as recommended by WHO except in 3 children with previously diagnosed HIV seropositivity. One positive ELISA and one positive Western Blot assay diagnosed HIV seropositivity.

**Results:** Forty-three HIV positive children aged six weeks to nine years (mean 16.5 months, SD 26.32) were admitted into the Paediatric unit (exclusive of the newborn unit) of the hospital, accounting for 5.7% of all admissions into the unit. There were 35 infants (81.4%). There were 18 males and 25 females (male: female ratio 1:0.72). The presumed modes of transmission were mother to child transmission 40(93.02%), blood transfusion 2 (4.6%) and an unidentified route 1 (2.3%). All parents were in the reproductive age group and there were 6 discordant couples identified (mother HIV positive, father HIV negative). Common presenting symptoms were fever 16(37.2.8%), diarrhoea 13(30.2%), difficult/fast breathing 12(27.9%) and vomiting 8(18.6%), while clinical signs were crepitations in the lungs 27(62.7%), pallor 22(51.2%), oral thrush 20(46.5%), hepatomegaly 18(41.9%), and dehydration 16 (37.2%). Admitting diagnoses were pneumonia 26(60.5%), septicaemia 4(9.3%), diarrhoea with dehydration, intestinal obstruction and malnutrition 2 (4.7%) each. There were 14 deaths (mortality rate 32.6%); accounting for 28.57% of total deaths in the paediatric unit during the period. Thirteen (13) (92.8%) deaths occurred in children aged 2 years old and below. The greatest contributors to mortality were pneumonia 10(71.4%) and septicaemia 2(14.3%). Poor nutritional status was associated ( $p<0.05$ ) with increased mortality.

**Conclusion:** The findings indicate that paediatric HIV/AIDS occurs predominantly by mother to child transmission and constitutes a significant cause of childhood morbidity and mortality at the National Hospital Abuja Nigeria. We recommend intensification of efforts to implement the existing prevention of mother to child transmission programme and further evaluation of pneumonia in HIV positive children.

**Key words:** Paediatric HIV/AIDS, HIV positive children, Mother to Child Transmission

### INTRODUCTION

HIV Infection is a significant cause of childhood morbidity and mortality (alone and in combination with other illnesses) in sub Saharan Africa including Nigeria. It is estimated that as at December 2005, 2.3 million children were living with HIV/AIDS, with 700,000 new infections and 570,000 HIV-related deaths among children worldwide, majority of, being in sub Saharan Africa<sup>1</sup> Hospital admissions among HIV positive children are quite significant with

admission rates varying from 1.5 - 29% of hospitalized children in Africa<sup>2-4</sup>.

Frequently identified morbidities among HIV positive children include acute respiratory infections, malnutrition, diarrhoeal disease, anaemia, malaria and meningitis<sup>2-7</sup>, a disease spectrum similar to HIV negative children but often more severe, resulting in more frequent admissions and longer hospital stays<sup>3-6</sup>. Deaths among HIV infected children are significant and frequent causes are diarrhoeal diseases, acute respiratory infections/pneumonias and malnutrition<sup>2, 3, 6-7</sup>. Mortality is highest in infancy<sup>5-7</sup>. There have being

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previous reports on Paediatric HIV/AIDS from Nigeria<sup>2, 9-12</sup> and Africa<sup>3-8</sup>. However, there is still a relative paucity of such information from Nigeria. The objective of this paper is to determine the mode of transmission, clinical presentations and outcome of hospital admissions in children with Paediatric HIV/AIDS at the National Hospital Abuja Nigeria.

## MATERIALS AND PATIENTS

The National Hospital Abuja is a 200-bed referral tertiary hospital located in Abuja, the Federal Capital Territory of Nigeria.

### Study population

This is a retrospective study of children with HIV/AIDS admitted into the Paediatric Unit (exclusive of the newborn unit) of the National Hospital Abuja Nigeria. Inclusion criteria All patients admitted into the Paediatric unit of the hospital over a twelve-month period (January - December 2000) who were found to be HIV positive were included in the study.

### Methodology

Data obtained from the case notes included socio demographic data, clinical history, physical examination, diagnoses and the outcome of the study subjects. Screening for HIV infection was done based on clinical criteria as established by the World Health Organization (WHO)<sup>13</sup>.

The Medical Microbiology and Parasitology Department of the hospital carried out all HIV diagnostic laboratory tests. HIV screening test was by the standard micro titre ELISA using Vironostika reagent kit (Organon Teknika, Boxtel USA), while confirmation test was by Western Blot using Immunoblot I and II (New LAV BLOT 1, NEW LAV BLOT 11 BIORAD France). Procedures adopted for all the tests and interpretations of the results were in accordance with the manufacturers' specifications. HIV seropositivity was diagnosed based on 1 (one) positive ELISA Screening test and 1 (one) confirmatory Western Blot Assay. It was not possible to assay for viral particles or antigens that is the gold standard of diagnosis in children aged less than eighteen months in whom maternal antibodies may persist<sup>5</sup>. A combination of clinical criteria and positive HIV antibody tests were used to arrive at diagnosis in this group of patients.

### Analysis

The results are presented as simple averages and percentages and statistical analysis was done using the chi-square test where appropriate.

## RESULTS

There were forty-three children identified with HIV/AIDS among the 756 children admitted into the Paediatric Unit (exclusive of the new born unit) of the National Hospital Abuja accounting for 5.7% of admissions over the period under review (January December 2000). These children were aged 6 weeks to 9 years (mean 16.5 months, SD 26.32). Thirty-five (81.7%) of them were infants (< 1 year). There were 18 males and 25 females with a male female ratio of 1:0.72. Nutritional status assessment by their percentage weights for age<sup>14</sup> showed 100 - 120%: 4 (9.3%), 80 - 100%: 10 (23.3%), 60 - 80%: 19 (44.2%), <60%: 10 (23.3%) (p>0.05). Twenty-nine (67.5%) of the patients had weights below 80% expected for age.

The patients were screened for HIV infection based on clinical criteria of WHO<sup>13</sup> except for two (2) babies of known HIV positive mothers and one (1) 8-year-old adopted child. All the patients were positive for HIV 1 infection. There were no cases of HIV 2 or mixed infections identified.

The presumed modes of transmission of HIV infection among these children were mother to child transmission (MTCT) 40(93.02%), blood transfusion 2(4.6%), and unidentified route 1(2.3%).

All the parents were in the childbearing age with mothers' aged 18 - 41 years and fathers 25 - 47 years. The birth order of the patients were 1<sup>st</sup> order 19, 2<sup>nd</sup> order 14, 3<sup>rd</sup> order and above 5. Information on the birth orders was not available in five (5) children. Of the 31 mothers who were screened for HIV infection, 28 were positive and 3 negative for the infection. There were 6 discordant couples identified, in which the fathers were negative while the mothers were positive for HIV infection.

Common presenting symptoms were fever (37.2%), diarrhoea (30.2%), difficult/fast breathing, (18.6%) and vomiting (18.6%), and signs were crepitations in the lungs (63.8%), pallor (51.2%), oral thrush (46.5%), hepatomegaly (41.9%), and dehydration (37.2%) (Table 1). Admitting diagnoses were pneumonias (60.5%), septicaemia (9.3%) and diarrhoeal disease (6.9%) (Table 2). It was not possible to determine the causative organisms in the patients with pneumonia. Blood cultures when performed were sterile and bronchial lavage/sputum induction was not performed. None of these patients was seen with pulmonary tuberculosis. Multiple entero-cutaneous fistulae occurred in a seven -week-old infant who had an initial surgery for presumed pyloric stenosis, but in whom enlarged mesenteric lymph nodes were found at surgery. He subsequently developed the fistulae post surgery with clinical deterioration and death. Encephalopathy was diagnosed in an eight-year-old girl with features of

progressive motor dysfunction (generalized spasticity), neuro developmental decline (loss of motor functions and inability to speak), seizures and CT scan findings of generalized brain atrophy.

There were 14 deaths (32.5% mortality) among the patients with greatest contributors to case fatality being pneumonia (71.4%) and septicaemia (14.3%). These 14 deaths accounted for 28.5% of all deaths in the unit occurring during the period under review. Table 4 shows that age specific case fatality was highest (75%) in the 1-5 years age group. Although there was no significant statistical difference ( $p > 0.05$ ) among deaths in the different age groups, thirteen (13) (92.8%) of the deaths occurred in children aged 2 years old and below. Children whose weights were less than 60% for their ages had the

highest mortality of 40%, followed by Those whose weight were 60-80% for their ages (36.8%). Patients in the weight for age range of 80-100% had a mortality of 30%. No death was recorded in those whose weights for age were over 100%. These differences were statistically significant ( $p < 0.05$ ).

Four children were taken away by their parents/care givers against medical advice (LAMA). This occurred after the diagnosis of HIV/AIDS was made in the children and their outcomes are not known.

The clinical presentations of the children are shown in Tables 1, while the diagnoses and age in relation to the outcome of the children are shown in Tables 2-3.

**Table 1 - Clinical presentations (symptoms and signs) in 43 children with HIV/AIDS**

Presenting Complaints	Frequency	Physical findings	Frequency
Fever	16 (37.2%)	Crepitations in lung fields	27 (62.8%)
Diarrhoea	13 (30.2%)	Pallor	22 (51.2%)
Difficulty/Fast breathing	12 (27.9%)	Oral thrush	20 (46.5%)
Vomiting	8 (18.6%)	Hepatomegaly	18 (41.9%)
Abdominal distension	3 (6.9%)	Dehydration	16 (37.2%)
Convulsions	2 (4.7%)	Skin lesions	13 (30.2%)
Weight loss	2 (4.7%)	Fever	10 (23.3%)
Others <sup>a</sup>	6 (13.9%)	Splenomegaly	7 (16.3%)
		Lymphadenopathy	6 (13.9%)
		Others <sup>b</sup>	6 (13.9%)

Others<sup>a</sup>: 1 each of vomiting blood, passing stools per vagina, bloody stools, facial swelling, inability to pass stools, irrational talk, refusal to feed

Others<sup>b</sup>: 1 each of recto-vaginal fistula, enterocutaneous fistulae, neck retraction, parotid swelling, hypothermia, generalised oedema

**Table 2: Pathological conditions identified and their outcomes in 43 children with HIV/AIDS**

Diagnosis	Frequency	Deaths	LAMA
Pneumonia	26 (60.5%)	10 (71.4%)	2
Septicaemia	4 (9.3%)	2 (14.3%)	
Gastroenteritis	3 (6.9%)		1
Intestinal Obstruction	2 (4.7%)		
Malnutrition/ Failure to thrive	2 (4.7%)		1
Severe Malaria	1 (2.3%)		
Urinary tract infection (UTI)	1 (2.3%)		
Multiple enterocutaneous fistulae	1 (2.3%)	1 (7.1%)	
Encephalopathy	1 (2.3%)		
Gastrointestinal haemorrhage	1 (2.3%)	1 (7.1%)	
Febrile illness	1 (2.3%)		
<b>Total</b>	<b>43 (100%)</b>	<b>14 (100%)</b>	<b>4</b>

Septicaemia - Acinetobacter species 1, Salmonella typhi 1, Staph aureus 1\*, Streptococcus species 1\* (deaths \*). UTI - Coliform species

LAMA - Left against medical advice

Severe complicated malaria was in the form of cerebral malaria with anaemia requiring blood transfusion.

Febrile illness was presumed to be due to septicaemia, but blood cultures were sterile.

Intestinal obstruction secondary to (1) congenital intestinal bands in a 6 week old infant and (2) ileo-colic intussusception in a 2 year old boy

**Table 3:- Age of the patients and their outcome**

Age	Alive	Dead	LAMA	Total
<1 year	21(60%)	11(31.4%)	3 (8.6%)	35
1-5 years	1(25%)	3(75%)		4
5-10years	3(75%)		1(25%)	4
<b>Total</b>	<b>25</b>	<b>14</b>	<b>4</b>	<b>43</b>

P>0.05

## DISCUSSION

Paediatric HIV/AIDS is a significant cause of morbidity and mortality among children at the National Hospital Abuja Nigeria. Although it constituted 5.7% of patients admitted, it was the commonest cause of deaths (28.5%) in the unit during the one-year period of the study.

The admission rate of 5.7% for Paediatric HIV/AIDS is higher than 1.5% previously documented for Jos Nigeria<sup>2</sup>, though less than 8 - 29.2%<sup>3,4,7</sup> from other parts of Africa. This increased admission rate may be due to an increasing prevalence of HIV infection recorded in Nigeria<sup>15</sup>, resulting in increased mother to child transmission, or that there is increasing awareness to HIV infection and higher indices of suspicion by attending physicians. The prevalence of HIV infection in Nigeria during the study period was 5.8%<sup>15</sup>. This figure was lower than in the other African countries where higher admission rates were recorded, suggesting a reduced prevalence of infection in Nigeria compared to these countries<sup>6</sup>.

All the mothers were diagnosed after primary diagnosis of their children, except for the two women who were aware of their HIV serostatus. This is in accordance with previous observations that through the detection of babies with HIV infection, their previously unsuspected parents could also be diagnosed<sup>9, 11</sup>. There were 6 discordant couples identified. This has enormous implications on the continuity of the marriages, the continued care and support of the children and the very existence of the family as the primary unit of society, as the men may abandon their families as experience in practice has shown. The birth orders of the patients showed that majority of them were 1<sup>st</sup> and 2<sup>nd</sup> children, with all the parents in the childbearing and economically productive age group. This underscores the importance of the need for HIV Voluntary Counselling and Testing (VCT) and prevention of mother to child transmission (PMTCT) measures where indicated and emphasizes the need for the provision of care and support of HIV infected adults in the community.

The presumed mode of transmission of infection was mother to child transmission (MTCT, vertical transmission) in the children aged below 5 years of life, which comprised greater than 90% of the patients in our study. This is the most common route of infection in children reported<sup>2,4,6</sup>, and underscores the importance and advantages of efficient and sustainable maternal antenatal diagnosis of HIV infection by VCT.

Two children had a history of blood transfusion, suggesting this as the route of infection as no other risk factors for the infection were identified. This has implications for prevention and emphasizes the need for proper and adequate screening of blood and blood products before their transfusion, which are often given in hospitals to children for various reasons including malaria in Africa.

Blood from donors who are in the window period of HIV infection transmit infection even though they test negative to HIV antibodies. It is therefore pertinent, with the advent of HIV and other blood borne infections, to transfuse blood only when necessary.

Common presenting clinical features were fever, diarrhoea, difficult/fast breathing, crepitations in the lungs, pallor and oral thrush. Pneumonia and septicaemia accounted for majority of admissions and deaths recorded in the study, similar to previous reports<sup>2-7</sup>.

Pulmonary infections have been reported as the major cause of morbidity and mortality in children infected with HIV<sup>3, 5, 7, 16</sup>. About 60% of the patients in this study had pulmonary infections in keeping with 13 85% reported from Africa<sup>3-7</sup>, where bacterial agents<sup>7, 8, 17</sup> and *Pneumocystis carinii*<sup>5, 6, 8, 16-18</sup> have being reported as its causes. Although we could not identify the causative agents of the pulmonary infections in our patients, our clinical evaluation and available laboratory parameters of raised white blood cell counts with neutrophilia suggest bacterial causative agents. There were no children with pulmonary tuberculosis (PTB) amongst the study population. This has been similarly reported<sup>8, 17</sup>. This might be related to the difficulty in diagnosing PTB in children in general, which is difficult to differentiate from other chronic pulmonary conditions seen in HIV infected children. It is also suggested that the more severe pneumonias responsible for hospital admissions are bacterial in origin, while PTB may present a chronic debilitating disease not commonly a reason for hospital admission until the late stages of the disease.

Diarrhoea and dehydration were common presentations. Fatality rate of 0% was probably because the children were on admission. It may also be due to the impact of the use of oral rehydration solutions (ORS) in diarrhoeal diseases in Nigeria, an intervention that has contributed positively to increased child survival by reducing mortality and morbidity from the ensuing dehydration.

Mortality was quite high amongst this group of children studied. They constituted the leading cause of death in the unit, infections been the major contributors to mortality. Most of the deaths had multi factorial origins, with younger age and poor nutritional status being associated with poor outcome. Effort should be aimed at preventing infections in HIV positive children through simple health measures such as improved nutrition, avoidance of overcrowding, hand washings and routine immunizations. Pneumonia in HIV positive children in Nigeria will require further evaluation, particularly as to the role of *Pneumocystis carinii*

(PCP) infection. This is important in determining the role of chemoprophylaxis for PCP and other specific preventive measures in the care of these children.

We conclude that Paediatric HIV/AIDS is an important contributor to childhood mortality and morbidity in Nigeria. There is the need to prevent vertical transmission of infection by sustaining PMTCT measures in our hospitals as well as measures to decrease adult HIV infection rates in the country. Pneumonia as a major contributor to morbidity and mortality among HIV positive children needs to be further evaluated in Nigeria. Chemoprophylaxis for children with HIV/AIDS should be identified and provided free by the government.

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