



## RESEARCH ARTICLE

### INCREASING ROLE OF HUMAN IMMUNODEFICIENCY VIRUS INFECTION AMONG CHILDREN WITH PROTEIN ENERGY MALNUTRITION

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#### ABSTRACT

Protein energy malnutrition is highly prevalent in the developing countries among the under-five children. Nigeria accounts for one third of all new HIV infections among children in the 21 priority countries in sub-Saharan Africa. HIV infection in children worsens their nutritional status with its attendant morbidity and mortality.

**Aim:** Thus this study seeks to assess the growing trend of HIV infection among malnourished children.

**Methodology:** A retrospective review of children admitted for acute severe malnutrition in the Children's ward of the University of Calabar Teaching Hospital. The study period was from 1<sup>st</sup> January 2012 to 31<sup>st</sup> July 2014.

**Result:** Eleven (17.2%) among the subjects studied had HIV infection. The males to female ratio among the HIV infected children was almost equal (1:0.8). Mortality was unacceptably high (37.5%).

**Conclusion:** There is urgent need to scale up prevention of mother to child transmission of HIV infection via equitable distribution of resources and encouraging ownership.

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## INTRODUCTION

Since the discovery of Acquired Immuno-deficiency Syndrome (AIDS) some three decades ago, it has emerged as a significant cause of immunological impairment among African children. (Asindi, 1995; Killian and Levy, 2011) Protein energy malnutrition (PEM) mostly precipitated by infections is also well documented as a cause of immune incompetence. (Bangoa, 1974; Hendrickse, 1991) Sub Saharan Africa (SSA) is occupied by 12% of the global population, but disproportionately has more than 90% of children younger than 15 years and 68% of adults that are living with HIV (WHO, 2011). Seventy percent of the new infection that occurred in 2010 was also recorded in SSA (WHO, 2011). An estimated 90% of pediatric HIV occurs through mother-to-child transmission (MTCT). (Lallemant *et al.*, 2011) Malnutrition and infections interacts with HIV disease in a complex cyclical way to contribute to significant morbidity and mortality (Zanoni *et al.*, 2011; Preidis *et al.*, 2011). There is still an unacceptable high burden of malnutrition in countries of Africa, (Ubesie and Ibeziakor, 2012; Ubesie *et al.*, 2012) as

well as preventable diseases like malaria, tuberculosis, diarrhea diseases and acute respiratory tract infections. Malnutrition among HIV infected children epitomizes the level of hunger and poverty in Africa. HIV infection is now likely to be an important additional factor contributing to both incidence of severe malnutrition and the high mortality. This may be due to the high mother-to-child transmission rate over the last decade. (Coulter, 1993) Children infected of HIV disease are more likely to have recurrent infections as well as very severe forms of malnutrition though HIV infection has a strong association with marasmus than with kwashiorkor. (Kessler *et al.*, 2001) It is therefore difficult to differentiate children with severe malnutrition secondary to poor intake from those of HIV infection clinically. The study was undertaken to evaluate the increasing role of HIV infection to childhood malnutrition.

## MATERIALS AND METHODS

The study was conducted among children admitted into the Nutrition Unit of the Department of Paediatrics, University of Calabar Teaching Hospital of Nigeria. Clinical records of children admitted within the period of Jan 2012 and July 2014 were reviewed. Information retrieved included sex, age, diagnosis of PEM and HIV/AIDS and outcome.

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Table 1. Socio-demographic variables among the study group

FEATURES	HIV INFECTION		Total STATISTICS
	Yes	No	
<b>Sex</b>			
Male	6	30	36
Female	5	2328	p= 0.203
<b>Diagnosis Category</b>			
Marasmus	8	29	37
Kwashiorkor	0	6	6
Marasmic-Kwash	1	56	p= 0.668
Underweight	2	13	15
<b>Outcome</b>			
Discharge	8	26	34
Lama	1	21	22
Died	3	5	8
			p= 0.063
<b>Sepsis</b>	34		
<b>SES</b>			
Low	9	49	58
			p= 0.361
Middle high	2	4	6
			p=0.14

Table 2. Increasing association of HIV infection with SAM

Study	Total	Marasmus	Kwashiorkor	Marasmic-K	Underweight	p-value
A-HIV1	206	63	106	37	-	
	4(1.9%)	1 (1.6%)	2 (1.8%)	1 (2.7%)		
B-HIV1	64 37	66	15	0.000		
	11 (17.2%)	8(12.5%)	0 (0.0%)	1(1.6%) 2(3.1)		

A – Earlier study, B – Index study, HIV1 – Human Immunodeficiency virus infection.

The clinical diagnosis of PEM was made using the Welcome classification of all children admitted into the unit. The diagnosis of HIV infection was confirmed using the PCR HIV RNA test after the detection of HIV antibodies using the (Determine test stripes)<sup>R</sup>. Results were reported using frequency tables and percentages.

## RESULTS

A total of sixty-four (15.8%) cases of acute severe malnutrition were seen out of four hundred and five children admitted during the study period. Eleven (17.2%) of the children were confirmed positive to HIV infection. The mean age of subjects was 17.35 months (range of 3-96months), 36 (56.3%) were males and 28 (43.7%) females. A large proportion 34 (53.1%) of these children were discharged while twenty-two (34.4%) were discharged against medical advice. The ratio of male to female of those who were HIV positive was 1:0.8. The overall mortality among the subjects was 12.5%, three of whom were HIV infected.

## DISCUSSION

The study showed a prevalence rate of 11 (17.2%) for HIV infection among children admitted for protein energy

malnutrition in the Paediatrics unit. This showed a significant association when compared to a previous report from same centre by Ekanem and Umotong, (Ekanem and Umotong, 1998) p = 0.000. This can be attributed to the lower rate of HIV transmission in the former study when compared to the latter. Moreover, the awareness and routine screening for HIV infection among malnourished children was low. Similar studies within the country (Kano 7.8% (Sudawa et al., 2013) in 2013, Enugu 22.4% (Ezeonwu et al., 2014) and Sokoto 27% (Yusuf et al., 2014) both in 2014) and other parts of Africa (Burkina Faso 14% 1989/90, (Yusuf et al., 2014) Malawi 21.6% (Thurstans et al., 2008) and 29.2% in a Sub-sahara meta-analysis studies in 2008 (Fergusson and Tomkins, 2009) and) have reported an increasing trend of HIV infection among severely malnourished children. These high prevalence may be attributed to the increasing screening rate for HIV infection among malnourished children. Furthermore, cultural beliefs regarding infant malnutrition which may differ in different parts therefore these wide disparities.

Most 37(57.8%) of the subjects were marasmic. This finding is consistent with other studies. (Anyabolu et al., 2014; Ndagije et al., 2007; Sunguya et al., 2011) HIV infection being a chronic infection is associated with severe wasting owing to the

increased energy demand in those affected. This situation is further complicated with other nutritional complications such as inadequate intake, micronutrient deficiencies, reduced absorption secondary to villi atrophy and frequent diarrhea episodes. Twenty-two (34.4%) of the PEM children discharged against medical advice. This is not surprising, lack of funds to procure medications, cultural belief in seeking traditional therapy, poor communication, dissatisfaction with care provided, mis-conception of the illness and ignorance may have influenced these decisions. Similar trends have been reported in other parts of the country. (Okoromah and Egri-Qkwaji, 2004; Aliyu, 2002) A large proportion, nine (81.8%) of the eleven children who had HIV were of the low socio economic class. A similar finding had earlier been reported by some Authors. (Sunguya *et al.*, 2011) This is a common finding for the simple reasons of low maternal literacy, most of these children are likely to be orphans, ignorance to mode of prevention as well as poor feeding attitudes. Moreover, these categories of parents find themselves in situations where they become victims of infection because most instances the only option for livelihood is sexual promiscuity. The overall mortality in this study was 12.5%. HIV infection affects the CD4 cells thereby compromising immune mechanism which is further worsen in malnourished children. This makes them vulnerable to a barrage of infections and the attendant complications. However, it was less than 28% as reported by Kessler *et al.* (2001) in Malawi. This may be attributed to the increasing awareness and routine screening of malnourished children for possible HIV infection and early commencement of antiretroviral therapy in the centre.

## Conclusion

HIV infection is contributing significantly to childhood malnutrition. Early detection of children with HIV infection and nutritional supplementation would reduce the prevalence of malnutrition through appropriate management. These can be achieved by strengthen policy in order to improve the quality and uptake of prevention of mother to child transmission of HIV infection both in rural and urban settings.

## Way forward

Nigeria has the highest number of children contracting the Human Immunodeficiency Virus (HIV), in the world, (UN report 2013). Despite the efforts of the federal and state governments to check the spread of HIV, the prevalence rate of HIV among Nigerian children has remained relatively stagnant with no significant improvement. Without urgent action in Nigeria, the global target for 2015 is unlikely to be reached. Therefore, there is urgent need to rapidly scale up service delivery to stop new HIV infections among children and to embark on an intensive state-focused data-driven decentralization initiative. The resources have to be channeled properly and claim ownership and do the right thing to avert lagging in the implementation of the prevention of mother to child transmission of HIV, (PMTCT) policy. A lot of work indeed needs to be done in PMTCT, through more strategic policies in the area of PMTCT need to be implemented. Education, enlightenment and access to drugs especially women in rural areas must be upgraded as many of them still

believe that HIV is a myth. Emphasis should be placed on women attending antenatal sessions and give birth there and not go to faith based organizations.

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