Original article

Clinical Manifestations of HIV/AIDS in Children in Northwest Ethiopia

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Abstract

Background: Pediatric HIV infection is a major world health problem, which is progressing at an alarming rate. Children with AIDS compared to immune competent ones present with disease patterns that are different in nature, severity and/or frequency.

Objective: To study the clinical profile of HIV/AIDS in children.

Methods: A retrospective study of 89 children with symptomatic HIV infection, aimed at evaluating the clinical manifestations of HIV infection in patients admitted to Gondar University Hospital over a period of five years.

Results: Eighty nine children having symptomatic HIV infection were studied. Their ages ranged from 16 months to 12 years. The median age was 2.8 years. Majority of the patients were from urban areas. The main presenting complaint were cough and/or difficult breathing 52 (58.4%) and diarrhea 47 (52.8%). Chronic diarrhea was seen in 34.8% of the patients. Commonly seen physical findings on admission were hepatomegaly (53.9%), fever (50.0%), respiratory distress (47.2%), skin lesions (46.1%), generalized lymphadenopathy (41.6%) and splenomegaly (29.2%). Neurological manifestations included developmental delay, microcephaly and seizure disorder. Most of the patients were malnourished. The main diseases that were identified were tuberculosis (70.9%), pneumonia (43.8%), oral thrush (25.8%) and chronic ear infection (24.7%). Eight (9%) of the patients died in the hospital.

Conclusion: The manifestations of HIV infection in children are protean and mimic a number of other illnesses. A high index of suspicion would therefore help in making early diagnosis and a management plan. [*Ethiop.J.Health Dev*. 2005;19(1):24-28]

Introduction

Pediatric HIV is a major world health problem, which is progressing at an alarming rate. In most cases it is due to transmission from HIV seropositive mothers during pregnancy, delivery or breast feeding (1-3). In two Ugandan studies 98% of the mothers of children with HIV infection were found seropositive when tested for the virus (4,5). As the majority of children become infected through mother to child transmission, perinatally acquired infection will parallel increase in heterosexual transmission and the numbers of infected women of childbearing age. Different studies show the rate of vertical transmission range from 14-39% (6) and a study in Ethiopian children estimated the risk of transmission to be 29-47% (7).

HIV infected children progress more rapidly than adults in the development of immune dysfunction and resultant illness (8). The highest incidence of AIDS occurs in the first one year of life and almost all cases of perinatal infection become symptomatic within the first ten years of life. Children with AIDS compared to immune competent ones present with disease patterns that are different in nature, severity and/or frequency. Pneumocystis carinii pneumonia, lymphoid interstitial pneumonia, recurrent bacterial infection and wasting syndrome are common AIDS indicating diseases (8).

A study done in Addis Ababa showed that the commonest diagnosed disease in children with AIDS are disseminated tuberculosis, pneumonia, persistent diarrhea, otitis media and marasmus (9).

In this study we assessed the disease patterns in children with AIDS admitted to Gondar University Hospital over a period of 5 years. The results of this type of study are essential for planning pediatric care for AIDS in children in resource poor setting.

Methods

Patients above the age of 15 months with a diagnosis of HIV/AIDS admitted to the pediatric ward of Gondar University Hospital between September 1998 and August 2003 were studied. The diagnosis of HIV/AIDS was made based on positive ELISA test for HIV, however as a positive serologic test doesn't confirm the diagnosis of HIV/AIDS in children below the age of 15 months they were excluded from the study.

Gondar University Hospital is located in the northwest of Ethiopia 750 km from Addis Ababa. The hospital serves as a referral center for North Gondar administrative region and the residents around. It has a bed capacity of 350 of which 70 are used for children under the age of 12.

The data was collected retrospectively from the clinical records of eighty nine patients by using a questionnaire designed for this purpose. The data collected included information on age, sex, presenting symptoms, anthropometric measurements, results of physical

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examination and laboratory studies. Data was entered into the EPI info version 6.1. Epidemiologic software. Descriptive statistical analysis was made using the same software package.

Definitions

Pneumocystis carinii pneumonia (PCP): considered in a child with respiratory distress and HIV infection who fails to respond to the conventional treatment for pneumonia with or without cyanosis or radiological finding suggestive of PCP.

Tuberculosis: diagnosed in children who present with respiratory symptoms and fulfill the WHO criteria for the diagnosis of tuberculosis.

Diarrhea: Passage of 3 or more loose stools per 24 hours

Persistent diarrhea: Diarrhea lasting for 14 days or more.

Chronic diarrhea: Diarrhea lasting for 30 days or more.

Oral candidiasis: Whitish patch in the buccal mucosa that is not easily removed by scrapping and/or angular cheilitis.

Microcephaly: head circumference < -2 SD

Macrocephaly: head circumference > +2 SD

Generalized lymphadenopathy: Lymphnodes measuring at least 0.5 cm in size in two or more non symmetric areas.

Cardiomyopathy: The presence of signs and symptoms of congestive heart failure and cardiomegaly on chest x-ray excluding other causes of heart failure like anemia, rheumatic heart disease and congenital heart disease.

Hospital acquired pneumonia: The occurrence of pneumonia after the third day of hospitalization.

Results

Between September 1998 and August 2003 two hundred eighty four children were diagnosed to have positive ELISA for HIV. Of these we were able to retrieve the records of 157 patients. Eighty nine of them were above the age of 15 months and the rest 68, who were below 15 months of age, were excluded from the study.

Their ages ranged from 16 months to 12 years the median being 2.8 years. Fifty eight (65.2%) of them were below the age of 5 years. There were 46 (51.7%) males and 43 (48.3%) females. Majority of the patients 76 (92.7%) were from urban areas (Table 1). Thirty one (36.9%) of the patients were admitted for two or more times in the hospital.

Twenty three (25.8%) of the patients had lost either their father or mother due to disease suggestive of AIDS. Nine of the fathers and 18 of the mothers were ill of tuberculosis, chronic diarrhea, herpes zoster or had lost significant weight by the time their child was admitted. Eight of the patients had parents who were divorced.

The main presenting complaint was cough and/or difficult breathing which was seen in 52 (58.4%) of the patients. Forty seven (52.8%) of the children had diarrhea on presentation of these 22 (24.7%) had persistent diarrhea. Chronic diarrhea either at presentation or in the past was seen in 31 (34.8%) of the patients.

Table 1: **Sociodemographic characteristics of 89 patients admitted with symptomatic HIV infection in pediatric ward of Gondar University Hospital. September 1998 - August 2003, Gondar, Ethiopia.**

Variable	Frequency	Percentage
Age (n=89)		
15 mo – 5 yr	58	65.2
5 yr – 10 yr	24	26.9
≥ 10 yr	7	7.9
Sex (n=89)		
Male	46	51.7
Female	43	48.3
Address (n=82)		
Urban	76	92.7
Rural	6	7.3
Paternal occupation (n=48)		
Military	16	36.3
Merchant	12	27.3
Government employee	6	13.6
Driver	5	11.4
Farmer	4	9.1
Daily laborer	1	2.3
Maternal occupation (n=48)		
House wife	2	58.4
Daily laborer	9	18.8
Small scale merchant	6	12.5
Student	4	8.3
Government employee	1	2.1

Commonly seen physical findings on admission were hepatomegaly (53.9%), fever (auxillary temperature of > 37.5^0C) (50.0%), respiratory distress (47.2%), skin lesions (46.1%), generalized lymphadenopathy (41.6%) and splenomegaly (29.2%) (Table 2). Herpes zoster was seen in 13 patients and all were above the age of 5, the youngest being five years and three months old.

Table 2: **Physical findings of 89 patients admitted with symptomatic HIV infection in pediatric ward of Gondar University Hospital, September 1998 - August 2003, Gondar, Ethiopia.**

Physical finding	Number	Percent
Hepatomegaly	48	53.9
Fever ($T^0 > 37.5^0$C) (n=78)	39	50.0
Respiratory distress	42	47.2
Skin lesions*	41	46.1
Generalized lymphadenopathy	37	41.6
Pallor	27	30.3
Splenomegaly	26	29.2
Clubbing	4	4.5
Cyanosis	2	2.3

***** Hypopigmented and hyperpigmented macules, maculopapular and pustular lesions

When the nutritional status of the under five children was assessed only 4/58 (6.9%) of them were having a normal weight for age. Marasmus was the most common type of malnutrition seen in 33 (56.9%) of the patients. In those aged 5 years and above 28/29 (96.6%) were underweight. 76/81 (93.8%) of the patients were stunted and 62/78 (79.5%) were wasted. Severe wasting was seen in 33.3% of the patients (Table 3).

Neurological manifestations that were seen include motor developmental delay 28/42 (66.7%), microcephaly 23/71 (32.4%) and seizure disorder 6/89 (6.7%).

Table 3: **Nutritional status of patients admitted with symptomatic HIV infection in pediatric ward of Gondar University Hospital, September 1998 - August 2003, Gondar, Ethiopia.**

Variable	Frequency	Percentage
Weight for age		
Under five children (n=58)		
Normal	4	6.9
Underweight	9	15.5
Marasmus	33	56.9
Kwashiorkor	3	5.2
Marasmic kwashiorkor	9	15.5
Above 5 years of age (n=29)		
Normal	1	3.4
Underweight	28	96.6
Height for age (n=81)		
Normal	5	6.2
Stunted	76	93.8
Weight for height (n=78)		
Normal	16	20.5
Mild wasting	13	16.7
Moderate wasting	23	29.5
Severe wasting	26	33.3
Head circumference for age (n=71)		
Normal	47	66.2
Microcephaly	23	32.4
Macrocephaly	1	1.4

The main diseases diagnosed in these patients include tuberculosis 63/89(70.9%), diarrhea 47/89(52.8%), and pneumonia 39/89(43.8%). Other commonly seen problems were oral candidiasis (25.8%), chronic ear infection (24.7%), PCP (11.2%) and cardiomyopathy (10.1%) (Table 4).

Eight of the children who were taking antituberculous drugs were being treated for tuberculosis for the second time and other nine patients had been treated for tuberculosis some time in the past.

Hematocrit, determined in 58 patients, ranged from 9 to 48%. The median was 28% and thirty three (56.9%) of them had a hematocrit less than 30%. Stool microscopy was done in 52 of the patients. Pus cell and/or red blood cells were seen in 15, *Strongyloides stercoralis* in 4, *Ascaris lumbricoides* in 3 and *Giardia lamblia* and hook worm each in two patients.

Twenty four (46.2%) of 52 patients had a total lymphocyte count less than 2000/mm^3. and 8 of them had a total lymphocyte count which was less than 1000/mm^3.

Twenty one (23.6%) of the patients developed complication while in hospital. The most common one was hospital acquired pneumonia seen in 13 of the patients. Seven were suspected to have sepsis, 3 had gastroenteritis and one patient had hepatitis following antituberculous drugs.

Seventy (78.7%) of the patients were discharged improved, 8 (9.0%) of the patients died in the hospital and the rest 11 (12.3%) were discharged in the same or worse condition. The mean duration of stay was 24.4 days, being 27.2 for those discharged improved and 12.9 for those who died in the hospital.

Table 4: **Diagnosis in 89 patients admitted with symptomatic HIV infection in pediatric ward of Gondar University Hospital, September 1998 - August 2003, Gondar, Ethiopia.**

Diagnosis	Frequency	Percentage
Tuberculosis	63	70.9
Diarrhea	47	52.8
Pneumonia	39	43.8
Oral candidiasis	23	25.8
Chronic ear infection	22	24.7
Herpes zoster	13	14.6
Mollescum contagiosum	12	13.5
PCP	10	11.2
Cardiomyopathy	9	10.1
Seizure	6	6.7
Parotitis	5	5.6
Rickets	2	2.2

Discussion

There is little information available on the clinical profile of HIV infection in children in Ethiopia with the exception of one published study that was conducted in Addis Ababa (9). In this study we have analyzed the manifestations of HIV infection in children. Exclusion of children below the age of 15 months has enabled us to avoid infants who just might be seropositive due to passive transfer of maternal antibodies. Exclusion of children below the age of 15 months with positive ELISA for HIV and poor record keeping were the limitations of this study.

Most of the patients (65%) were below 5 years of age. Only 8% of the children were 10 years and above. Studies show that less than 5% of the perinatally infected children survive long without therapy and in the majority the median survival is around 6 years of age (10). The median age in this series was 2.8 years this is in contrast to 3.8 years in a study done in Addis Ababa (9).

HIV is wide spread in Ethiopia. The 2002 report of Ministry of Health showed that the urban prevalence is much higher (13.7%) than the rural prevalence (3.7%) (11); this is reflected in this study where more than 90% of cases were from urban areas.

One of the challenges of HIV/AIDS is the large number of orphans it leaves behind. According to revised 2000 USAID estimates, there were 34.7 million children under age 15 in 34 countries who have lost their mother, father, or both of their parents to HIV/AIDS and other causes of death (12). This study has shown 26% of these children had lost their parents due to AIDS; this is similar to what has been observed in Addis Ababa (26%) (9).

The main presenting features were cough and/or difficulty of breathing and diarrhea which were seen in 58 and 53% of the patients. This is comparable to what is seen in Addis Ababa 60 and 53% respectively.

More than one third (35%) of the patients suffered from chronic diarrhea. In contrast to acute gastroenteritis in seronegative children which lasts an average of 3 to 7 days, diarrhea in children with AIDS may persist continuously or intermittently for weeks or months (13). Prevalence of chronic diarrhea was also high in other studies, 52% in Kinshasa (13), 38% in Nigeria (14) and 21% in Zimbabwe (15).

Tuberculosis has emerged as a major infectious complication of HIV infection in developing countries (16). It was seen in 61 and 68 percent of the patients in Addis Ababa (9) and India (17) respectively. Tuberculosis was also commonly seen in this series (71%).

The common respiratory problems seen in this series were pneumonia (44%) and chronic otitis media (25%). Pneumocystis carinii pneumonia was entertained on clinical grounds in 11% of the patients. Pneumonia was seen in 47, 43 and 26 percent of patients in Mexico (18), Addis Ababa (9) and Cote d'Ivoire (19) respectively. In a study in Thailand pneumonia was the cause of death in 52% of the patients (20). Special staining techniques used to diagnose pneumocystis carinii pneumonia in Zimbabwe showed a prevalence rate of 16% (21), figure wise this is comparable to our finding.

Hepatosplenomegaly and generalized lymphadenopathy were commonly seen in our study. This is comparable to what have been observed in India where hepatomegaly, splenomegaly and lymphadenopathy were seen in 52, 49, and 35 percent of the patients respectively (17).

Infants who acquire HIV perinatally have birth weight and height percentiles comparable to uninfected ones (22) but may develop postnatal growth retardation. Chronic diarrhea, opportunistic infections or HIV infection per se may be responsible for protein energy malnutrition. In this study only 7% of the under five and 3% of the above five children had a normal weight for age. The prevalence of stunting and wasting was also high, 94 and 80 percent respectively. This dictates that nutritional intervention should be instituted early in the care plan of these children.

Neurologic abnormalities occur frequently in children with symptomatic HIV infection and include cognitive, language and motor deficits, as well as acquired microcephaly (23). They are a major cause of morbidity and contribute to a fatal outcome (24). In Mexico 60% of children had neurologic manifestations (2). The common neurologic manifestations that were commonly seen in this series were developmental delay and microcephaly.

Anemia is said to occur in 20-70% of HIV infected children, more commonly in those in those with AIDS. This could be due to chronic infection, poor nutrition or autoimmune phenomenon (10). In this study 57% of the patients had a hematocrit level which is less 30% this is close to what is seen in Addis Ababa where 66% of the patients had a hematocrit of 30% and below.

Low $CD4^+$ count (< 500/mm^3 in children 1-5 year and < 200/mm^3 in children more than 5 years) is associated with severe immunosuppression (10). However expense prohibits the use of $CD4^+$ count as an indicator of immunosuppression in many of the developing countries. Studies have showed a good correlation between $CD4^+$ count and absolute lymphocyte count (25-27). A total lymphocyte count between 1000-2000/mm^3 appears to be a useful predictor of significant immunosuppression as measured by a $CD4^+$ T-cell count less than 200/mm^3 in HIV infected persons (28). This shows that a significant number of our patients had severe immunosuppression.

In conclusion the clinical manifestations of HIV are protean and mimic a number of other illnesses. A high index of suspicion would therefore help in making early diagnosis and a management plan not only for the patient but also for the entire family.

Acknowledgment
We gratefully acknowledge all the staffs involved in the management of these sick children.

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