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Original Research Article

A study on clinical profile of paediatric HIV infection in the age group of 18 months to 12 years and its correlation with CD4 count

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ABSTRACT

Background: The aim of the study was to assess the clinical profile of pediatric HIV infection in the age group of 18 month to 12 years and to correlate the clinical features with their CD4 count.
Methods: This descriptive study was conducted over a period of 1 year from October 2007 to October 2008 at Govt. Mohan Kumaramangalam Medical College Hospital, Salem and included 100 children (aged between 18 months-12 years) diagnosed HIV by using rapid antigen tests or ELISA. Demographic data, clinical manifestations correlating with CD4 count and nutritional status of the children were recorded in predesigned proforma and analysed.
Results: 100 children were included (males-65 and females-35) in the study. 22 children were asymptomatic and 78 were symptomatic. Clinical symptoms like skin lesions in 29, oral lesions in 10, lymphadenopathy in 46 children were observed. The respiratory (13%), central nervous (12%) and haemotological systems (16%) were most commonly involved organs systems. Children in stage III and IV disease were into Grade I-IV PEM classification (for weight) and majority of stage I-IV children were in Grade II according to Mclaren's classification (for height).
Conclusions: Majority of children with HIV infection presented with various clinical manifestations, malnutrition and immunosuppression. Hence, early identification of the disease and proper management in children helps in improving the immunological status and thereby life span of the child.

Keywords: CD4 count, HIV infection, Pediatrics

INTRODUCTION

HIV/AIDS is a global epidemic now and it has the potential to affect all countries and all population.[1] HIV infection is progressively becoming a leading cause of childhood morbidity and mortality in India. Presently 2 million children of below 15 years of age are having HIV/AIDS globally.[2] Perinatal mode of transmission of infection accounts for 80–90% of HIV disease in paediatrics.[3,4] Hence it becomes very important to identity these patients and put them under regular followup and to start antiretroviral treatment (ART), if necessary at the earliest. India accounts for high global HIV burden and Tamil Nadu comes under Intermediate prevalent zone with antental mothers with HIV infection <1% with STI >20%. As per the sentinel surveillance report by NACO for the year 2006-2007, incidence of HIV infection in antenatal mothers in Salem is 4% and hence mother to childhood transmission increases multifold.[5]

This study is aimed to identity the early clinical features of HIV infection. Thus, by knowing the clinical spectrum of HIV infection in our region, screening can be intensified on the suspected children and early diagnosis can be made, which will help in early management and in decreasing the incidence of HIV related morbidity.

METHODS

This descriptive study was conducted over a period of 1 year from October 2007 to October 2008 at Govt. Mohan Kumaramangalam Medical College Hospital, Salem and included 100 children (aged between 18 months-12 years) who were registered in ART centre. Diagnosis of HIV was confirmed in those children by rapid antigen tests or ELISA. Children <18 months were excluded from the study as the facility for making diagnosis by PCR was not available in the centre.

Informed consent was obtained from the parent/guardian for the HIV testing with appropriate pre-and post-test counseling.

A special proforma was designed to record the following information: demographic data, history at presentation, clinical findings, nutritional status, developmental history, stage of disease, parental and sibling status, mode of transmission. Special investigations were performed if clinically indicated (depending on the symptomatology at presentation).

Pulmonary tuberculosis was diagnosed on the basis of complete blood count, CXR, sputum examination/resting gastric juice analysis, history of contact, non-responsiveness to conventional antibiotics and good Response to antibiotic treatment.

TB lymphadenitis was diagnosed based on aspiration cytology (FNAC) report. HIV encephalopathy was diagnosed based on clinical features, cerebrospinal fluid (CSF) analysis and neuroimaging. Skin manifestations were noted by the diagnosis made on the skin lesions by Department of dermatology.

Nutritional status of the children was also calculated based on IAP classification (for weight) and Mclaren's classification (for height). Patients were treated symptomatically based on the basis of their clinical presentation. Opportunistic infections were treated effectively and appropriate prophylaxis was administered for prevention of relapse of opportunistic infections.

RESULTS

Hundred children with HIV who were registered in ART centre over a period of 1 year were included in the study. Of them 65 children were males and 35 were females. 22 children were under the age less than 4 years and 78 children were at the age group of 4-12 years. In Ninety-seven (97%) children the disease was transmitted from mother and by blood transfusion in two (2%) children and in one (1%) case mode of transmission was unidentified.

98 of the cases were delivered through vaginal route, one (1%) child by lower segmental caesarean section and 1 child was adopted. Forty-nine children (49%) out of 100 were fed through breast milk, 50% by both breast and cow's milk and one (1%) fed with milk formulae (Table 1).

Table 1: Demographic details of the study participants.

Variables	Number of patients (n=100)
Sex	
Male	65
Female	35
Age	
< 4 years	22
4-12 years	78
Mode of transmission	
Mother to child	97
Blood transfusion	2
Unidentified	1
Mode of delivery	
Vaginal route (normal)	98
Cesarean section	1
Adopted child	1
Feeding	
Breast milk	49
Breast and cow milk	50
Milk substitute	1

Twenty-two (22%) children were asymptomatic in the study with CD4 ratio of 18-35% and seventy-eight children were symptomatic and their clinical stage with CD4 ratios was given in Table 2. CD4 ratio was on the higher side in stage I and II diseases and it is lower for stage III and lowest in stage IV.

Table 2: Clinical features of patients.

Clinical features	No. of patients	CD4 range	CD4 ratio
Asymptomatic	22	349-2263	18-35%
Symptomatic			
Stage I (persistent generalized lymphadenopathy)	10	349-2263	18-35%
Stage II (Mild symptoms)	39	304-2083	7-29%
Stage III (Moderate symptoms)	24	81-1277	7-32%
Stage IV (Severe symptoms)	5	10-227	6-14.5%

Organ/system specific manifestations of 78 symptomatic patients were given in Table 3.

Skin lesions were noticed in 29 children, oral lesions in 10, lymphadenopathy in 46 cases, respiratory, CNS, GI and haemtological manifestations was seen in 14, 12, 3 and 6 cases respectively. Nutritional status of the children was presented in Table 4.

Table 3: Organ/system specific manifestations in symptomatic children with HIV.

Organ/system specific clinical features	No. of patients	CD4 ratio
Skin lesions		
Scabies	2	12%-20%
Eczema	4	20%-24%
Molluscum	1	11%
Herpes	3	7-31%
Pruritic papular eruptions	14	24-35%
Extensive impetigo	2	11%
Seborrhic dermatitis	3	22%-24%
Oral lesions		
Candidiasis	3	8-10%
Leukoplakia	2	25%
Glossitis	2	30%
Gingivostomatitis	3	28%
Lymphadenopathy		
Lymphadenopathy alone	12	18%-35%
Along with other stage II and stage III clinical features	22	7%-29%
TB lymphadenitis	12	11%-32%
Respiratory system		
TB pneumonia	10	6%-31%
Empyema	1	17%
Bronchiectasis	2	7%-16%
Central nervous system		
TB meningitis	2	6%-14.5%
TB spine	1	10%
HIV encephalopathy	9	7%
Gastrointestinal system		
Chronic diarrhea	1	8%
Hepatosplenomegaly	2	9%-10%
Haemotological manifestation		
Severe anaemia	16	

Table 4: Nutritional status of symptomatic children with HIV.

Weight (%)	Stage I	Stage II	Stage III	Stage IV
< 50% (Grade IV-very severe)	0	0	5	1
50-60% (Grade III-severe)	2	6	6	2
60-70% (Grade II-moderate)	9	9	5	1
70-80% (Grade I-mild)	10	12	4	1
> 80% (normal)	9	9	5	-
Height (%)				
< 80% Grade III-Dwarf)	1	4	5	2
80-93% (Grade II-short)	19	18	15	3
> 93% (Grade I-normal)	13	15	5	0

Children in stage III and IV disease were into Grade I-IV PEM classification (for weight) and majority of stage I-IV children were in Grade II according to Mclaren's classification (for height).

DISCUSSION

HIV in children has faster progression because of immature immunity. About 10-20% of children below 4 years of age infected with HIV were died due to rapid progression and related complications of the disease. Remaining 80-90% of the infected children had the mean survival time of approximately 9-10 years.[6] In the present study, 100 children infected with HIV were included. Male preponderance (65%) was seen in the study. Most of the infected children (78%) were at the age group of 4-12 years. 97% of children acquired the infection by vertically transmission (from mother). These observations were similar to the studies of Lodha et al.[7]

CD4 count was made in the study to assess the immune status there by clinical features of the disease in the patients. 22% of children were asymptomatic with CD4 ratio of 18-35%. Most of the children in this study were symptomatic (78%). The major clinical feature observed was generalized lymphadenopathy in 46% of children. In a study conducted by Lodha et al it was 33.3% out of 27 symptomatic children and in another study done by Shah et al, general lymphadenopathy was seen in 23.8% children out of 42.[7,8] The other clinical manifestations noted were skin lesions (29%) and oral lesions (10%). These were in accordance with the observations made by Dhurat et al in 55 symptomatic children.[9] HIV weakens the immune system thereby opportunistic infections develop very rapidly. Children with opportunistic infection have lower CD4 values compared to others without opportunistic infections.[10,11]

In the present study, tuberculosis was found to be the commonest opportunistic infection in 25% children (including all forms of TB) with low CD4 ratio ranging from 6-32%. Similar observation was noted by Merchant et al in 84 (29.4%) patients out of 285.[12] Abuzaitoun et al had 21% cases with HIV encephalopathy in their series.[13] Nine (9%) of our patients had HIV encephalopathy with low CD4 ratio of 7%. The neuroimaging features were also consistent with the findings of encephalopathy in these patients. Presence of HIV-encephalopathy is related with poor outcome for survival.[14] Severe anemia (<8 g%) was found in 16% of children in our study. This may be due to consistent bone marrow changes with anemia, adverse effects of medications, nutritional deficiencies and peripheral destruction of erythrocytes .[13] Anemia has been noted in symptomatic patients in the study by Dhurat et al and Merchant et al.[9,12] In this study, a nonspecific finding such as hepatosplenomegaly and chronic diarrhea was seen in one and two patients respectively. Similar findings were also noted by Lodha et al and Madhivanan et al.[7,15] HIV was related with malnutrition as was evident from our study, similar

observation has been reported in other studies as well.[16] Protein energy malnutrition leads to depletion of CD4 counts, and this further intensified by the presence of HIV infection, which was observed in this study.[17,18] Children in stage III and IV disease were into Grade I-IV PEM classification (for weight) and majority of stage I-IV children were in Grade II according to Mclaren's classification (for height). This may be due to poverty, negligence, repeated infections etc. Limitations of the study was to mostly we have observed only the clinical features of slow progressors and since children <18 months were not included in the study the clinical manifestation of rapid progressors could not be identified. Diagnosis of PCP in one child was made on the basis of clinical features and a CXR finding. This was not confirmed by BAL/ biopsy. Investigations to identify cytomegalovirus, toxoplasmosis, hepatitis infection were not done.

CONCLUSION

From the observations it was concluded that, perinatal transmission is the most common mode of acquiring HIV infection in children. Hence, appropriate ART to mother and baby during peripartum period, elective LSCS, proper milk substitution will definitely found to be effective in reducing mother to child transmission. Intensified screening of HIV infection in asymptomatic children by high suspicion will help in diagnosing HIV at the earliest, and thus they can be subjected to early management like chemoprophylaxis, immunization, management of opportunistic infection, nutritional support and anti-retro viral (ARV) therapy and follow up periodically.

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