

Research Article

A study of mode of transmission, clinical presentations, WHO and immunological staging among HIV infected children

Durgesh Kumar^{1,*}, Mukesh V. Singh¹, Dinesh Kumar¹, K. M. Shukla¹, D. K. Singh¹, Dharmendra K. Singh²

¹Department of Pediatrics, Rural Institute of Medical Sciences and Research, Saifai, Etawah, U.P., India

²Department of Pediatrics, MLN Medical College, Allahabad, U.P., India

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*Correspondence:

Dr. Durgesh Kumar,

E-mail: drdurgeshk@gmail.com

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ABSTRACT

Background: The clinical manifestations of HIV infection vary widely among infants, children, and adolescent. So there is a need to study the mode of transmission, clinical presentations, WHO and immunological staging among HIV infected children.

Methods: Observational analytic cross sectional study. The children who were HIV positive (confirmed by ELISA for HIV-1 and HIV-2), and attending the OPD of ART Centre and SN Children Hospital, Allahabad during period of one year. The study population consisted of 47 patients, belonging to both sexes and age of 18 months to 19 years. Detailed history was taken and full clinical examination done in all cases. CD4 count was estimated at the time of presentation.

Results: Predominant mode of transmission in our study was vertical and it was present in 95% cases. Fever was the most common presenting complaint and was present in 28 (59.57%) cases. The most common clinical sign was pallor in our study, present in 37 cases (78.72%) followed by lymphadenopathy 34 (72.34%). On the basis of WHO clinical staging, most of the patients in our study were found in stage 2. On the basis of immunological staging, 51% had no evidence of immunosuppression (stage 1), 18 (38.3%) had mild to advanced immunosuppression (stage 2 and 3) and 5 (10.63%) patients were severely immunosuppressed (stage 4).

Conclusion: In HIV infected children predominant mode of transmission is vertical. Fever and pallor are common clinical manifestations. Most of the patients are found in WHO clinical stage 2 and immunological stage 1.

Keywords: HIV, Mode of transmission, Fever, Pallor, WHO stage, Immunological stage

INTRODUCTION

HIV infection is a worldwide problem but more so in developing countries. Ever since, the report of first pediatric case in 1983, there has been an alarming increase in the rate of disease. Approximately 2.5 million children under 15 years of age, were living with HIV/AIDS at the end of 2007.¹ Combination Antiretroviral therapy access among children remains limited with only 15% of clinically eligible individuals received treatment in year 2006.² With more data becoming available, the gravity of the problem is being

better understood and HIV infection in children and adolescent is being recognized as a major issue. The children and adolescent acquire HIV infection mainly through perinatal transmission (vertical transmission) from an infected mother to her fetus. The rate of transmission of HIV from untreated infected mother to their fetuses & newborn infants has been estimated to be between 15% and 40%.¹ This mode of transmission accounts for over 85% of pediatric HIV infections.³ Other less common modes of transmission are through the receipt of infected blood or blood products or I/V drug abuse and sexual transmission.

The risk factors for vertical transmission include preterm delivery, a low maternal antenatal CD4 count, use of illicit drugs during pregnancy, >4 hours duration of ruptured membranes and birth weight <2500g.

The clinical manifestations of HIV infection vary widely among infants, children, and adolescent. In most infants, physical examination at birth is normal. Initial sign and symptoms may be subtle and non-specific, such as lymphadenopathy, hepatosplenomegaly, failure to thrive, chronic or recurrent diarrhea, interstitial pneumonia, or oral thrush, and may be distinguishable from other causes only by their persistence. Absolute CD4 lymphocyte counts have been considered as most reliable marker of disease progression.^{4,5} Opportunistic infection in HIV infected children are generally seen in setting of severe depression of CD4 Count and have been basis of indicating ART as well as prophylaxis against opportunistic infections.⁶

METHODS

Forty seven newly diagnosed HIV infected children and attending the OPD of ART Centre, OPD and indoor patients of SN Children Hospital during period of one year from August 2008 to July 2009 were enrolled in the study. The children who were HIV positive (confirmed by ELISA for HIV-1 and HIV-2), and age of 18 months to 19 years were included in the study.

Ethical approval was obtained from the local ethical committee. Written consent was taken from parents/guardian prior to investigation. Detailed history was taken and full clinical examination done in all cases. History was taken for symptoms related to fever, cough, dyspnoea, weight loss, oral ulcers, loose stools, skin changes, etc. Apart from this, information regarding dietary intake, immunization status, drug intake, and past history of diseases such as persistent diarrhea, jaundice, tuberculosis, recurrent chest infections, nail infections, skin lesions, and other chronic illness was taken. Parents and sibling's HIV infection status was also enquired. Complete physical examination was done with special attention to lymph nodes, parotid swelling, spleen, liver, skin lesions and presence of pallor to assess clinical state of patient and clinical staging done on the basis of WHO pediatrics clinical staging criteria and allocated as stage 1,2,3 and 4.⁷

Absolute CD4 count was done with Partec CyFlow® counter flow cytometer. CD4 count is used to assess the immunological status of the HIV infected child. CD4 counts are higher in infant compared to that of adults, and falls to adult values by age 5 year.

Mode of transmission

Proper history was taken regarding mode of transmission including history of blood transfusion, use of non sterilized instruments, any past surgery, sexual abuse or

sexual contact (specially in adolescents) and maternal HIV status.

Data analysis

Data was analyzed using SPSS software. To describe nominal data, simple percentages were used. Mean and standard deviations were used to describe normally distributed data from the subjects. The Spearman rank correlation test was used to determine the relationship between different continuous variables.

RESULTS

Study population

Out of 47 patients, enrolled in study, 37 (78.7%) were male and 10 (21.3%) were female with overall male to female ratio 3.7:1. The mean age of patients was 6.64 years (SD 3.59years) which ranged from 1.5 to 14 years. The most commonly involved age group was 1.5-5 years. Almost half (46.81%) of cases belongs to this group. As the age increased, the number of cases found to be decreased. There was no case in age group 15-19 years.

Table 1: Distribution of cases by age and sex.

Age group	Male (%)	Female (%)	Total (%)
1.5-5 Year	18 (38.30)	4 (8.51)	22 (46.81)
5-10 Year	13 (27.66)	4 (8.51)	17 (36.17)
10-15 Year	6 (12.77)	2 (4.25)	8 (17.02)
15-19 Year	0 (0.00)	0 (0.00)	0 (0.00)
Total	37 (78.73)	10 (21.27)	47 (100)

Mode of Transmission

Perinatal transmission was found to be the most common mode of acquiring HIV infection in children. In our study 45 (95.74%) cases were infected perinatally while one (2.13%) case was infected via blood transfusion. In one case, mode of transmission was not known.

Table 2: Mode of transmission of HIV infection in cases.

Mode of transmission	Number of cases	Percentage
Perinatal	45	95.74
Blood transfusion	1	2.13
Unknown	1	2.13
Total	47	100

Clinical Presentation

Fever was most common presenting complaint and it was found in 28 (59.57%) cases. Next common presentation was loose stools and it was found in 23 (48.94%) of

cases. Other common presentations were itching over body (23.40%), not gaining weight (17.02%), cough and rapid breathing (14.89%), oral ulcers (14.89%), abdominal distension (10.63%) and ear discharge (8.51%). Weight loss was uncommon presentation and it was found only in 2 (4.25%) cases. Not gaining weight was more common and was seen in 8 (17.02%) cases.

On clinical examination, pallor was most common finding in cases and was found to be present in 78.72% (37 cases). The next common findings were lymphadenopathy 34 (72.34%) and skin lesions 25 (53.19%). Hepatosplenomegaly was present in 11 (23.40%), while isolated hepatomegaly and isolated splenomegaly were present in 4 (4.51%) and 5 (10.63%) cases respectively. Other findings were respiratory distress (10.63%), parotid swelling (6.38%) and icterus (4.25%).

Table 3: Clinical signs of patients in the present study.

Clinical sign	Present	
	Number	Percentage
Pallor	37	78.72
Icterus	2	4.25
Lymphadenopathy	34	72.34
Parotid swelling	3	6.38
Skin lesions	25	53.19
Respiratory distress	5	10.63
Hepatosplenomegaly	11	23.40
Isolated Hepatomegaly	4	4.51
Isolated Splenomegaly	5	10.63

Correlation between WHO clinical and Immunological staging

On the basis of clinical examination and WHO Clinical staging criteria, clinical staging was done in every case. Out of 47 cases, 6 (12.76%) cases were found in stage 1, 26 (55.31%) cases in stage 2, 13 (27.66%) in stage 3 and 2 (4.26%) cases were in stage 4.

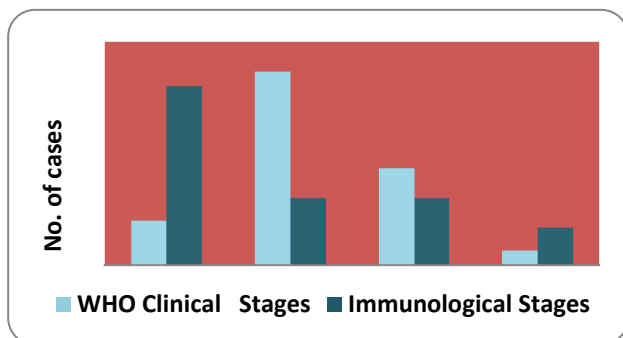


Figure 1: Distribution of cases in clinical and immunological stages.

On the basis of absolute CD4 count and WHO immunological staging criteria, immunological staging was done in every case. Out of 47 cases, 24 (51.06%) cases were found in stage 1, 9 (19.15%) cases each in stage 2 and stage 3 and 5 (10.63%) cases were in stage 4.

DISCUSSION

Globally, the HIV epidemic remains a serious challenge, and continues to take its toll particularly on children. Ongoing perinatal transmission substantially impacts the incidence of pediatric HIV, adding to the large pool of HIV-infected children in India. The problem is likely to get compounded by background co-morbidities in affected children. In most infants, physical examination at birth is normal. Initial signs and symptoms may be subtle and non-specific, such as fever, lymphadenopathy, hepatosplenomegaly, failure to thrive, chronic or recurrent diarrhea, interstitial pneumonia, or oral thrush and may be distinguishable from other causes only by their persistence.

Out of 47 patients, 37 (78.7%) were male and 10 (21.3%) were female with overall male to female ratio 3.7:1. This male preponderance in our study may be related to the extra attention and concern shown to the male child in this region of our country, accounting for higher health facility visits for their illness. The mean age of patients was 6.64 years (SD: 3.59 years) which ranged from 1.5 to 14 years. The most commonly involved age group was 1.5-5 years. Almost half (46.81%) of cases belonged to this age group. As the age increased, the number of cases was found to be decreased. There was no case in age group 15-19 years. Shet A et al (2006)⁸ found mean age of patients 7 years (SD : 3.4 years).

Predominant mode of transmission in our study was vertical and it was present in 95% cases. Blood transfusion was considered the cause of infection in 1 child. In one case, mode of transmission could not be determined. Vertical transmission was reported as mode of transmission in 94% children by Agarwal D et al (2007).⁹ Merchant R H et al¹⁰ document vertical transmission in 86.66%, Shah I (2005)¹¹ in 83% cases and Ogunbosi BO et al (2011)¹² in 93.3% cases.

In our study fever was the most common presenting complaint in HIV infected children and was present in 28 (59.57%) cases. Next presenting complaint was loose stools, present in 23 (48.94%) cases. Agarwal D et al (2007)⁹ reported fever as a most common presenting complaint followed by diarrhea in their study. In the study of Rakesh Lodha et al (2003)¹³ most common presenting complaint was recurrent fever and was present in 73.6% cases. Okechukwu AA et al (2008)¹⁴ also reported fever as a commonest presenting complains (80.3%), followed by progressive weight loss (77.5%), and persistent diarrhoea (69.1%).

The most common clinical sign was pallor in our study, present in 37 cases (78.72%) followed by lymphadenopathy 34 (72.34%) and skin lesions 25 (53.19%). Oniyangi O et al (2006)¹⁵ reported pallor in 51.2%, oral thrush 46.5% and hepatomegaly in 41.9% cases. In the study of Emodi J et al (1998)¹⁶ lymphadenopathy was present in 59% and, various skin manifestations in 37%.

On the basis of WHO clinical staging, most of the patients in our study were found in stage 2 while in the study of Agarwal D et al (2007)⁹ most of the patients were in stage 1. On the basis of immunological staging, 51% had no evidence of immunosuppression (stage1), 18 (38.3%) had mild to advanced immunosuppression (stage2 and3) and 5 (10.63%) patients were severely immunosuppressed (stage4). Almost same type of distribution of patients was reported by Shet A et al⁸ and Agarwal D et al (2007).⁹

In conclusion, this study has provided additional information with regard to the use of clinical manifestations of HIV infection and CD4 count in initiating antiretroviral therapy. Prevention of mother to child transmission (PMCT) is the most cost effective program and one of the most attractive interventions for prevention of HIV infection in children.

Key Messages

In HIV infected children predominant mode of transmission is vertical. Fever and pallor are common clinical manifestations. Most of the patients are found in WHO clinical stage 2 and immunological stage 1.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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