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Original Research Article

A clinico-epidemiological study of HIV infected children in western Rajasthan

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ABSTRACT

Background: Assessment of clinico demographic characteristics of HIV infected children in western Rajasthan.
Methods: All the children who were attending Antiretroviral treatment (ART) center for one year period were enrolled for study as pre-ART and ART group. All the data pertaining to clinical and demographic characteristics were recorded. They were further classified into clinical staging as per WHO guideline and immunological staging based on CD4 count in accordance with CDC classification of immunodeficiency.
Results: Perinatal transmission is the most common mode of acquiring HIV in Pediatric age, who most commonly presented with Fever and diarrhoea along with failure to thrive. Tuberculosis and oral candidiasis were the commonest opportunistic infections in this geographic area.
Conclusions: A proper history, detailed clinical examination and high index of suspicion would therefore help in making early diagnosis to institute an appropriate management plan.

Keywords: Adherence, Antiretroviral therapy, CD4 count, Pediatric HIV

INTRODUCTION

AIDS- Acquired Immune Deficiency Syndrome-also known as *Slim Disease* caused by Human immunodeficiency virus (HIV) is an important health problem in developing countries including India, and children are becoming the innocent victim of this dreadful disease.[1]

In Rajasthan, first case of HIV was detected in Pushkar in mid-eighties and the state implemented HIV programme as part of NACP-I and NACP -II with 1284 AIDS cases till March 2005 and estimated HIV cases in Rajasthan come to about 88560. In the context of HIV in India, Rajasthan with an official Sero-prevalence of 0.5 percent can be described as a highly vulnerable, high-priority state.[2]

In children more than 95% cases occurred by the vertical transmission, intrauterine (20 to 30%), intrapartum (70 to 80%), breast feeding by chronically infected women (9 to 16%), breast feeding in women who acquire HIV postnatally (29 to 53%).[3,4] Transfusion of infected blood or blood product has accounted for 3 to 6% of all pediatric AIDS cases. HIV infected Paediatric patients required lifelong treatment, regular follow up and monitoring.[5,6] Follow up is the important concern while treating the HIV infected children that includes Clinical and immunological monitoring, treating opportunistic infection Pre-ART counselling and treating side effect of

ART are the important components of the management of HIV infected children.

Hence, this study is therefore aimed to evaluate various clinical modes of presentation, and immunological behaviour of HIV infected children at first time attending our ART centre.

METHODS

This observational prospective study conducted in the ART centre attached to a tertiary care center of a teaching hospital of Western Rajasthan during the period of one year and follow up done for on ART children at interval of six and twelve month.

All those patients who were diagnosed for anti- HIV antibodies by different methods as per National AIDS Control Organization (NACO) guidelines and registered in ART center during the study period were enrolled

A detailed history (demographic, clinical, family, socioeconomic, drug, contact) and physical examination and anthropometric measurement (WHO standard growth chart and Z score) of HIV children attending ART centre were recorded and investigated for Hemoglobin, total and differential leukocyte count, ESR, chest X ray, MT test, LFT, RFT, urine, baseline CD4 count. Other relevant investigation was done as and when required. All the patients were examined at every visit for opportunistic infections like tuberculosis, P Carni etc, and Cotrimoxazole prophylaxis started as per NACO guideline.

Patients were classified according to WHO clinical staging guideline and immunological staging based on CD4 counts.

RESULTS

In present study, out of total 142 HIV infected children, 92 (64.78%) cases were enrolled as pre-ART (Anti retro viral therapy) group and 50 (35.21%) cases were on ART treatment.

In pre-ART group 52 were male and 40 were female. The Mean age of presentation in male children was 6.83 +/- 3.74 years whereas in female children it was 6.41 +/-3.54 years though mean age of presentation in male children is higher than female children but the difference found was statistically not significant (p= >0.6 t= 0.54 DF= 90.) However, the maximum number 43(46.73%) of HIV infected children were in 1 to 5 years of age.

In ART group children out of 50, 37 were male and 13 were female and the male to female ratio was 2.8:1. The mean age of presentation in male children was 9.18 +/- 3.4 years whereas in female children it was 7.8 +/- 4.0 years and the difference was not found significant (p = >0.3 t= 1.08 DF= 48) while the maximum number of HIV infected child 16 (32%), occurring in 9 to 12 years of age in ART group.

Majority of cases belonged to rural area (87.32%) while only (12.68%) belonged to urban area. According to occupation of father out of 142 cases most of cases belong to laborer group (53.03%), followed by driver (18.93%), and carpenter (12.87%). This denotes high risky behavior among the rural migrant worker of the population.

Out of 142 cases father status of HIV was positive in 91 cases and negative in 27 cases whereas mother status of HIV was positive in 104 cases, negative in 24 cases. In 24 cases HIV status of father and in 14 child HIV status of mother was unknown due to either expiry of parents or child was brought from child care home.

Most of HIV cases (85%) belonged to low socio-economic status and father live far away from their family for earnings, meanwhile they exposed with HIV during sexual contact. Vertical transmission was found to be predominant mode of transmission in this study, which is 74.60% based on maternal sero-positivity whereas mode of transmission was unknown in 35.40% of the cases.

In present study, clinically most of the cases presented with fever (72%)/ (45.65%), cough (48%/)/ (32.60%), FTT (46%)/ (37%), weight loss (42%)/ (15%), diarrhea (36%)/ (31%), and skin lesion (40%)/ (24%) in ART and pre-ART group respectively.

The nutritional status of 46 (65.32%) children was normal while 35 (24.64%) children were wasted, 18 (12.67%) child was stunted, and 43 children (30.28%) were both wasted and stunted according to WHO Z score.

In present study, commonest opportunistic infections were pulmonary tuberculosis (38%), recurrent diarrhea (28%), and recurrent pneumonia (24%) in ART Group whereas the common infections among pre-ART patient were ARI (42.39%), diarrhea (32.60%), lymphedenopathy (17.39%) and hepatospleenomegaly in (9.78%).

In present study, most of pre-ART cases were in WHO clinical stage II (64.13%) and ART cases were in WHO clinical stage III (52%). At the time of presentation pre-ART child present with lower WHO clinical staging, while on ART child present with higher WHO clinical staging which is also statistically significant.

In ART GROUP 1 to 5-year age group patient had mean CD4 count 372.21, 6 to 9-year age group 185.85 CD4, 9 to 12-year age group 169.87, and more than 12-year age group patient had mean CD4 count 139.50 cell/cmm^3 but this is statistically not significant (p>0.03). pre-ART group 1 to 5-year age group patient had mean CD4 count 1081.90, 6 to 9-year age group 706.13 CD4, 9 to 12-year

age group 615.22, and more than 12-year age group patient had mean CD4 count 517.57 cell/cmm^3. This is statistically significant (p <.005) therefore as the age advances at the of presentation mean CD4 count decrease, in both on ART, and pre-ART groups found in our study.

DISCUSSION

Out of 142 HIV positive children were enrolled in this study 92(%) children were on pre-ART, and 50(%) children were on first line pediatric ART treatment according to pediatric ART NACO guideline. The mean age of presentation in PRE ART group was 6.64 years but most of the cases (46.73%) were in the age group of 1 to 5 years, whereas in ART group majority of the cases (36%) were in the age group of 9 to 12 years with the mean age was 8.82 years that is little higher in our study as compared to the studied by other worker namely Agarwal et al 2008, shah et al 2005, Ramesh et al 2007 and S Gomber et al 2011, where they reported mean age of presentation 4.8 yrs, 4.7 yrs, 5.75 yrs and 6.24 yrs respectively.[7-10] The possible reason of this higher mean age of presentation could be due to delay in the diagnosis and referral to the ART registration because patient residing in remote and rural area (87.32%) and the lake of awareness of patients/parents and on the part of referring physician.

In the present study, out of total enrolled on ART children, (74%) were males and (26%) were females. Male to female ratio is 2.8:1 that is comparable to Agarwal et al they reported similar sex ratio 2.9:1 in their study. 85% cases belong to low socioeconomic family, and 15% were belong to middle class family which was in accordance to other authors like Adler et al 2006, in their study it was found that lack of socioeconomic resources is linked to the practice of riskier health behaviors, which can lead to the contraction of HIV. These behaviors include earlier initiation of sexual activity and less frequent use of condoms. Ickovics et al. 2002, in their study it was found that among women, lower social standing and the experience of life stress are associated with riskier sexual practices. This finding suggests that while ethnicity is a critical factor in the HIV/AIDS epidemic for women, social class is also an important risk factor in HIV infection. In our study 87.32% cases belonged from rural area and 12.68% belonged from urban area. The possible reason for rural dominance that, estimated 1218 million population in India live in rural areas, 11 parents of HIV positive children acquired HIV infection from urban cities where they go for earning work, and expose with HIV infection by unsafe sexual intercourse, and transmit the infection at home place (in rural area).

In present study, by occupation most of fathers were laborers (53.03%), followed by driver (18.93%), and carpenter (12.87%). HIV exposure is more common in certain occupation and migrant workers.

In our study, commonest mode of transmission was vertical transmission (74.60%), and unknown in (25.40%). This was comparatively lower than other study by Agarwal et al and Ramesh R pol who reported (94%), and (94.37%) respectively, is probably due to unknown HIV status of 14 children due to either expiry of parents or children were brought from the community based HIV child care home.[7,9]

The most common presentation in the present study at the time of diagnosis were fever (72%), cough (48%), chronic diarrhoea (36%) and weight loss/FTT (42%), skin lesion in (40%), lymphadenopathy in (32%), hepatospleenomegaly in (28%), Persistent/recurrent bacterial pneumonia (16%), ear discharge in (6%) HIV infected children on ART group. Gomber et al also reported most common presentation of HIV infected children was fever (83%), weight loss/FTT (67%), chronic diarrhoea (39%).[10] Another study conducted in 2008, by Agarwal et al reported fever (53%), cough (29%), chronic diarrhoea (36%) in their study.[7] Another study conducted in 2005 by Shah et al reported fever (50%), weight loss/FTT in (49%), chronic diarrhoea in (34%) in their study.[8]

Severe malnutrition/wasting and stunting are also the common presentation of HIV infection in our study, out of all enrolled patient 24.64% were wasted, 12.67% children were stunted and 30.28% children were both wasted and stunted. Among 142 patients 96 child were either wasted/ stunted or both. Similar results are also reported by Gomber et al in their study they reported 22% wasted, 38.9% stunted and 38.9% both wasted and stunted.[10] WHO recommends if malnutrition not improved with appropriate and standard management, and cause of malnutrition is not obvious then child should be screen for HIV.

In our study, most common Opportunistic infections was tuberculosis, pulmonary tuberculosis was in 38%, lymph node tuberculosis in 8% cases, recurrent or chronic diarrhea in 28%, recurrent pneumonia in 24% cases, Oral candidiasis in 12% cases, herpes simplex in 8% cases, wart in 8% cases, recurrent oral ulceration in 6% cases, recurrent ear discharge 6% cases, and Herpes zoster in 4% cases. Whereas in study conducted by Agarwal et al in 2008, reported pulmonary tuberculosis 18.6% cases, oral candidiasis 3% cases, and herpes zoster in 1% cases.[7] While in another study conducted in 2007 by Ramesh et al reported pulmonary tuberculosis 38 % cases, and oral thrush in 22% cases.[9]

The higher rate of tuberculosis is due to overall high prevalence of tuberculosis in this part of western Rajasthan and also high association of tuberculosis with immunosuppression recommends every newly diagnosed tuberculosis patients should be screen for underlying HIV infection and all HIV positive children should be periodically screened for the presence of tubercular infection.

Table 1: Distribution of cases (pre-ART and ART) according to who clinical stage.

Who clin. Stage	Pre- ART case (n=92)	%	ART case (n=50)	%
I	30	32.60	00	00
II	59	64.13	12	24
III	03	3.26	26	52
IV	00	00	12	24
Total	92	100	50	100

X2 = 86.49, DF=03; p < 0.001

In present study, most of pre-ART cases were in WHO clinical stage II (64.13%) f/by stage I (32.60%) while on ART cases they were in stage III (52%) f/by stage IV (24%). This shows that pre-ART child presented with lower WHO clinical staging, while on ART child present with higher staging. A study conducted in Guru Teg Bahadur Hospital reported similar result (WHO clinical stage III (46%), and in stage IV 28% cases). (Table 1).[10] At the time of presentation pre- ART child present with lower WHO clinical staging, while on ART child present with higher WHO clinical staging which is also statistically significant.

Table 2: According to age wise distribution of baseline CD4 count.

Age group	No. of pt on art	Mean CD4 count	No. of pt on pre-ART	Mean CD4 count
1-5 year	14(28%)	372.21 Sd 192.48	43(46.73%)	1081.90 Sd 326.60
6-9 year	14(28%)	185.85 Sd 65.54	24(26.08%)	706.13 Sd 296.53
9-12 year	16(32%)	169.87 Sd 37.40	18(19.56%)	615.22 Sd 165.56
>12 year	06(12%)	139.50 Sd 50.70	07(07.60%)	517.57 Sd 82.38

On ART group, 1 to 5-year age group mean CD4 count was 372.21, 6 to 9 years 185.85, 9 to 12 years 169.87 and more than 12 years was 139.50 cell/cmm^3 whereas in pre-ART group, 1 to 5 years 1081.90, 6 to 9 years 706.13, 9 to 12 years 615.22 and more than 12 years CD4 count was 517.57 cell/cmm^3. Similar observation was also reported by Gomber et al and Agrawal et al.[10,7] This observation shows that as the age advances mean CD4 count decrease, in both on ART, and pre-ART groups. This needs an early diagnosis of HIV, and early referral, training of primary health care provider/pediatrician. (Table 2).

CONCLUSION

The manifestations of HIV infection in children are protean and mimic a number of other illnesses, a proper history, and detailed clinical examination, high index of suspicion would therefore help in making early diagnosis to institute an appropriate management plan.

Prenatal transmission is the most common mode of acquiring HIV in Pediatric age, who most commonly presented with Fever, diarrhoea and failure to thrive. Tuberculosis and oral candidiasis were the commonest opportunistic infections in this geographic area.

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