

Correlation of mucocutaenous manifestations of HIV infection with the degree of immunosuppression in children

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Abstract

Background: Skin is commonly involved in HIV infection. Dermatological manifestations in HIV patients tend to be more severe, may manifest atypically, are often resistant to treatment, and tend to have a high rate of recurrence. **Aim and objective:** To correlate mucocutaneous manifestations of HIV infection with the degree of immunosuppression in children. **Material and method:** 102 children affected by HIV were included in the study. Data collection was done with pretested questionnaire. Data included gender, age, mode of transmission of HIV from parent to child, time of onset of skin manifestations and clinical examination. A complete one-time dermatologic examination of the skin, mucosae, hair and nail was performed. The diagnosis of cutaneous disorders were made clinically and confirmed by appropriate laboratory investigations. **Results and Discussion:** Our study of 102 pediatric HIV population with skin manifestation show peak incidence between 6 to 12 years with 86.27 %. Only 4.90% of total patients present in 0 to 3 yrs, youngest being 2 yrs of old. Mucocutaenous manifestations of HIV infection increases with increased immunosuppression in children.

Keywords: HIV.

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Received Date: 26/06/2018 Revised Date: 22/07/2018 Accepted Date: 13/08/2018

DOI: <https://doi.org/10.26611/1014723>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
17 August 2018

INTRODUCTION

Human immunodeficiency virus (HIV) infection in children is becoming a common occurrence. In children, it is largely a preventable disease. Skin manifestations constitute one of the most common clinical features in such children and their clinical pattern and severity is more or less in accordance with their CD4 counts. Thus

an early recognition of such features is important for an early diagnosis and also to assess the prognosis of HIV infection. Children with HIV infection are more prone to adverse cutaneous drug reactions, both to anti-retroviral therapy (ART) and to other drugs that are given concomitantly for comorbid illnesses. The first pediatric case of AIDS was reported to the Centre for Disease Control and Prevention (CDC) in November 1982. Globally, there were a total of 33.2 million people living with HIV, in 2007, of which 2.5 million (7.5%) were children under the age of 15 years¹. Total number of deaths was 2.1 million, of which 330,000 were children. It is estimated that more than 90% of children living with HIV acquired the virus during pregnancy, birth, or breastfeeding, forms of HIV transmission that can be prevented². In 2007, it is estimated that there are 2.31 million (1.8-2.9 million) people living with HIV/AIDS in India (making it the third largest country with regard to the number of people with HIV) with an estimated adult

HIV prevalence of 0.34% (0.25-0.43%). Out of the estimated number of PLHA (people living with HIV/AIDS), 39% are females and 3.5% are children³. Skin is commonly involved in HIV infection and nearly 90% of patients with HIV infection have dermatological manifestations at some stage during the course of their disease^{4,5}. The data currently with regard to the mucocutaneous manifestations of HIV infection in pediatric population come mainly from the western literature. The prevalence of mucocutaneous manifestations in children with HIV infection, from various parts of the world, is highly variable, ranging from as low as 42% to almost 93%.^{6,8-12} In India, skin manifestations among HIV-infected children show a prevalence rate varying from 30 to 80%^{7,13,14}. HIV-infected children often present with common childhood infections. These, however, tend to be more severe, may manifest atypically, are often resistant to treatment, and tend to have a high rate of recurrence.

MATERIAL AND METHODS

Present study was a cross sectional type carried out in tertiary care centre in western Maharashtra from Jan 2016 to March 2017. All children (<12 year) diagnosed with HIV with skin manifestations in Dermatology wards, Pediatric wards, Dermatology OPD, Pediatric OPD and Any other medical ward were included in the study. We studied 102 patients.

Inclusion Criteria: All pediatric patient (<12 years) having Documented Laboratory diagnosis of HIV infection (by a positive DNA PCR in those < 18 months and a positive ELISA test in those > 18 months).

Exclusion Criteria: 1. HIV positive pediatric patient without skin manifestations or disease 2. guardians not willing to participate in the study. Study was approved by ethical committee of the hospital. A written valid consent was taken from guardians after explaining study to them. Data collection was done with pretested questionnaire. Data included gender, age, mode of transmission of HIV from parent to child, time of onset of skin manifestations and clinical examination. A complete one-time dermatologic examination of the skin, mucosae, hair and nail was performed. The diagnosis of cutaneous disorders were made clinically and confirmed by appropriate laboratory investigations where indicated (scrapings, cultures, biopsies, serology, etc.). Blood investigation was performed for calculation of CD 4 count to assess grading of immunosuppression. Data analysis was done with appropriate statistical tests.

RESULTS

Our study of 102 pediatric HIV population with skin manifestation show peak incidence between 6 to 12 years

with 86.27 %. Only 4.90% of total patients present in 0 to 3 yrs, youngest being 2 yrs of old. Out of 102 children 58(56.86%) were males, and remaining were females 44(43.13%) In our study of 102 population most manifestation were of infective in etiology in origin(64.70%) in that infective etiology , most were VIRAL in origin 29(28.43%) Next common was pruritic popular eruptions (PPE) 17(16.66%). Which was inflammatory in nature which was of non infective in origin, next common was SCABIES 14(13.72%) which was parasitic infection in nature .Bacterial origin were 12 (11.76%), Fungal origin were 11 (10.78%). 14 children were having allergic reactions with 13.72 % (fig.1 and table1) Out of 102 pediatric HIV population majority were having skin manifestation of infective in etiology in origin 66(64.70%). Non infective were 36(35.29%). out of 66 children with infective etiology 29 children were having viral skin manifestations 43.93%. of total infective etiology. Next were 14 children are having Scabies with 21.21% of total infective etiology .12 children were having bacterial skin manifestation with 18.18% of total infective etiology .11 children were having fungal skin manifestation with 16.66% of total infective etiology. 36 children were having skin manifestation of non infectious etiology of which 17 children were having PPE with 47.22% of total non infective etiology. In our study of 102 HIV infected children 83 children acquired through PERINATAL transmission which was 81.37% among total transmission which was highest among all transmissions. 6 children acquired through blood transmission which accounts for 5.88 % of total children. (fig 2) Out of 102 patients both parents were effected in 79 children with 77.45% of total population. Only one parent was effected in 7 children with 6.86%. Both parents were not effected in 10 children with 9.80%. Status of parents not known or parents are dead in 6 children with 5.88% In our study most of children 88 out of 102 fall in category of 6 to 12 yrs in that 53 patients are in stage 1 i.e. CD4 count more than 500. 32 out of 88 patients in more than 5 yrs group were in stage 2 i.e. CD4 count 200 to 500. only 3 patients of more than 5 yrs group were having CD4 count less than 200. In our study only 14 children present in group with age from 1 to 5 yrs , in that 8 patients were having CD4 count 500 to 1000, and 6 patients were having count less than 500. Out of 12 children with bacterial infection 11 patients were having CD4 count more than 500 and one patient was having CD 4 count 200 to 499 group, mean CD4 count of bacterial diseases was 765.83 with standard deviation 244.36 with p value 0.02 which was significant. which implies that bacterial diseases were associated with CD4 count more than 500. Out of 11 children with fungal infection⁸ children were having CD4 count 200 to 499. 2 patients

were having CD4 count more than 500 .Mean CD4 count for fungal infection was 459.2727 with standard deviation 317.9617 with P value 0.006 which is significant , which implies that fungal infection were more common in children with CD4 count less than 500. Out of 29 children with viral infection 18 children were having CD4 count less than 500.11 children were having CD4 count more than 500 Mean CD4 count for viral skin diseases was 497.82 with standard deviation 160.59 with P value 0.01 which is significant which implies that viral skin infections were more in children with CD4 count less than 500.Out of 17 patients with PPE 10 patients were having CD4 count more than 500.5 children were having CD4 count from 200 to 499. Mean CD4 count for PPE was 601.41 with standard deviation 291.31 with P value 0.92 which was not significant which implies that PPE does not show any statistically significant association. Out of 14 patients with scabies 11 children were having CD4 count more than 500 .Mean CD4 count for scabies was 654.42 with standard deviation 205.34 with P value 0.15 which is not significant which implies that there is no statistical association.

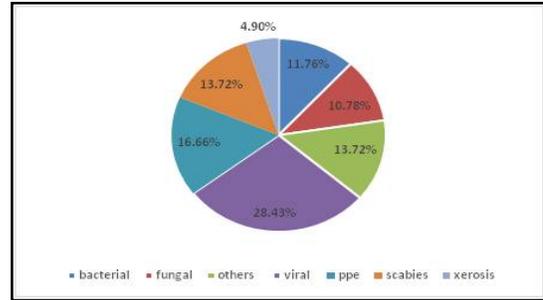


Figure1: distribution of patients according to infective etiology

Table 2: distribution of patients according to etiology and gender

Etiology	Male	Female	Total	Percentage
Infective	36	30	66	64.70%
Non infective	22	14	36	35.29%
Total	58	44	102	100%

Table 1: Distribution of patients according to dermatological manifestations and gender

Dermatological manifestations	Male	Female	Total
Acneform eruption	4	0	4
Acute contact dermatitis	3	2	5
Eczema	3	3	6
Furunculosis	2	0	2
Herpes labialis	2	1	3
Herpes simplex	4	3	7
Herpes zoster	1	0	1
Impetigo	2	2	4
Kerion	1	1	2
Maculopapular rash	1	1	2
Molluscum	5	5	10
Multiple warts	1	5	6
Oral candidiasis	2	3	5
Ppe	12	5	17
Scabies	10	4	14
Seborhic dermatitis	1	0	1
Steven Johnson	2	0	2
Tinea corporis	0	2	2
Tinea cruris	1	1	2
Tubercular sinus	0	2	2
Xerosis	1	4	5
Total	58	44	102

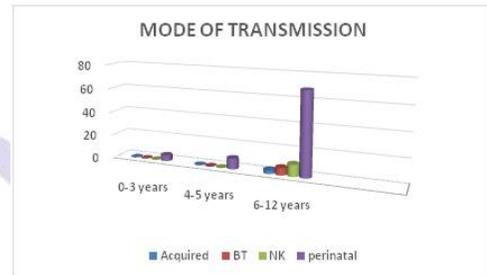


Figure 2: distribution of patients according to mode of transmission

Table 3: Age distribution with respect to CDC classification

Stage	<1yr	1 to 5yrs	>5yrs	Total
Stage 1	0	0	53	53
Stage 2	0	8	32	40
Stage 3	0	6	3	9
Total	0	14	88	102

Table 4: correlation of infection and mean CD4 count

Infection	Obs	Total	MeanCD4	Variable	SD
Bacterial	12	9190	765.8333	59714.52	244.3655
Fungal	11	5052	459.2727	101099.6	317.9617
PPE	17	10224	601.4118	84863.26	291.313
Scabies	14	9162	654.4286	42167.03	205.3461
Viral	29	14437	497.8276	25790.86	160.5953
Others	19	13211	695.3158	100264.9	316.6463
Total	102	61276	600.7451	70944.67	266.3544

Table 5: relation of skin diseases with CD4 count and their significance

Skin manifestations	0 to 199	200 to 499	500 and above	mean	P value
Bacterial	0	1	11	12	0.02
Fungal	1	8	2	11	0.006
Others	0	5	14	19	0.2
PPE	2	5	10	17	0.92
Scabies	0	3	11	14	0.15
Viral	0	18	11	29	0.01
TOTAL	3	40	59	102	

DISCUSSION

In Our study of 102 pediatric HIV patients with skin manifestations, peak incidence is in 6 to 12 years age group with 86.27 % which in comparison with Kondreddy *et al*¹³ and Millembe F Panya *et al*¹⁴. Out of 102 children 58 (56.86%) are males, and rest were females 44(43.13%). Other studies have reported different prevalence levels^{15,16} indicating a wide regional variation. According to Nachman S, *et al*, children less than five years of age, are the less affected than the older ones¹⁷. Infections are the most frequent cause of mucocutaneous disorders among HIV infected children^{4,6,16} which has also been shown in this study. The authors who carried out similar longitudinal surveys also observed the higher frequency of infectious diseases, which varied from 52.4% 4 to 73%.^{4,18}. In adults, Spira and Rosatelli found a higher number of patients with infectious skin diseases. The highest number of infectious dermatoses results most likely from the alteration of skin barrier functions resulting from the disease; Stingl cites the reduction of Langerhans cells responsible for presenting antigens that reach the skin through the immunological system. According to Smith, the increase in colonization by staphylococcus would be responsible for the higher number of infections in patients with reduced CD4 T-lymphocytes. In a study involving 40 patients by Vania olivera de Carvalho¹⁹ commonest mode of acquiring the infection was by vertical transmission accounting for 97.5% in 39 patients out of 40. In a study conducted by Okechukwu²⁰ commonest mode of acquiring infection was by vertical transmission which accounts for 69.9% in 65 patients. In a study involving 104 patients by Kondreddy¹³ commonest mode of acquiring infection was by vertical transmission accounting for 96.15% in 100 out of 104 patients. In present study involving 102 patient's commonest mode of acquiring infection is by vertical transmission which is in 83 out of 102(81.37 %), by blood transfusion in 6 children out of 102(5.88%) which in correlation with other studies. The present study show similarity with other studies like Madhivanan P²¹ where most common mode of transmission is by perinatal transmission 67%, Pol RR²² where it was 94.37%. Most of children in present study are fall into category of no

immunosuppression with 53(51.96%).and next are fall into category of moderate immunosuppression with 40(39.21%) which is in comparable with other studies like Millembe F Panya²³ 129 (37%), Okechukwu²⁰ 34(36.5%), Wanankulal⁹ (43%). Only 9 patients were in category of severe immunosuppression. The present study show similarity with study by Ranganathan K²⁴ where only 20(15%) are in severe immunocompromised group. This is because majority of children in present study were on regular HAART. There was strict adherence and strict follow up of patients regarding HAART therapy. Because these children does not becomesevere immunocompromised. so most children in present study were mild to moderate but not severe immunocompromised.

CONCLUSION

Mucocutaenous manifestations of HIV infection increases with increased immunosuppression in children Proper anti retroviral treatment will be helpful for reducing infections in these children

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Source of Support: None Declared
Conflict of Interest: None Declared