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EFFECT OF HAART AMONG HIV INFECTED CHILDREN'S-EXPERIENCED IN TERTIARY CARE HOSPITALS IN BANGALORE CITY

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ABSTRACT

Human immunodeficiency virus (HIV) infection in children is becoming a common occurrence and skin manifestations constitute one of the most common clinical features in such children. There is paucity of studies on the cutaneous manifestations in Indian HIV children, present study aims to document various dermatological manifestations in children with HIV and to correlate with clinical WHO staging, CD4 T-cell count and percentage.

A retrospective and cross sectional secondary data were collected from ART centres of Bangalore city, Jan 2010 to Dec 2011. Out of 72 children below 16 years of age group of HIV infected children meet their inclusion criteria. Collected data was analyzed by using SPSS-16.50 version. Univariate analysis and percentage match was used to draw the significant inference. A total of 72 children were recruited with written consent, majority was between 5-10yrs (61%) and male: female ratio was 1.2:1. The predominant mode of transmission was perinatal transmission (91%). Malnutrition was observed in 61% of children's. The prevalence of dermatological lesions was 65%, both infectious and non-infectious lesions occurred with equal frequency. Hair and nail paradoxical changes were observed among 36% and 11% respectively. The most common dermatological lesion was papulopruritic dermatoses (23%), followed by molluscum contagiosum (19%), xerosis (19%), aphthous ulcer(17%) and mucocutaneous candidiasis (15%). Early initiation of HAART, maintenance of better CD4 count, lack of malnutrition and cleanliness are the important factors to be taken care in HIV infected children's.

KEYWORDS: HIV, Immunosuppression, Dermatological Lesion, HIV, CD4 T-Cell Count

INTRODUCTION

Skin disorders are commonly encountered in HIV-infected Peadiatric patients, and they may be the first manifestation of HIV disease. Up to 90% of HIV-infected persons suffer from skin diseases during their course of illness.[1] In a local cross-sectional study of 186 HIV positive patients, 175 (94%) suffered from one or more cutaneous disorders.[2] The most common skin disorder identified was fungal infection, followed by eczema and seborrhoeic dermatitis. The spectrum of skin disorders depends on Immunologic stage, as reflected by CD4 count, Concurrent use of HAART and Pattern of endemic infections. In general, declining immunity is associated with increased number and severity of skin disorders.[3] Skin lesions are more likely to have unusual appearance in advanced HIV infection.

Children represent 6% of all people infected with HIV/AIDS. Globally, the estimated number of children living with HIV/AIDS is 2.5million[1]. Studies on different domains of pediatrics have been trying to look out the correlation between CD4 cell count and systemic changes. Skin disease is one health problem among HIV positive patients presenting with a variety of dermatological conditions. The muco-cutaneous manifestations often are associated with poor general health status and indicate a worse prognosis of the disease, as well as a diagnostic factor in the monitoring of the immune

status of the patients.[2] Several studies among adults have shown that the association of skin disorders with HIV can serve as an indicator for advanced HIV infection, immunosuppression and decreased CD4 cell counts [3], Thus, this study aims to determine the prevalence of dermatological manifestations and correlate with clinical features.

METHODS

A retrospective and cross sectional secondary data were obtained from ART centres of Bangalore city from Jan 2010 to Dec 2011. A total of 72 HIV infected children below 16 years of age group were considered for the study. All eligible patients meet their inclusion criteria. Informed Consent was obtained from parents or guardians. A predesigned proforma was used to collect the information on importance to the skin lesions -onset, type, duration and mode of transmission. Children's who are about to have anti-retroviral therapy (HAART) were also considered. Clinical, laboratory and Anthropometric parameters (WHO growth charts) were documented systematically. Battery of investigation was done for examination of skin lesion; mucous membrane from head to toe at the time of presentation. Genital area and skin appendages was recorded. Collected data were analyzed by using SPSS-16.50 version, univariate analysis and descriptive statistics was used to draw the significant inference.

RESULTS

Demographic profile - As per the result found that, male/female ratio was 1.2:1. 58% of children were completely immunized, Demographic profile of the patients was recorded and it was found that 63.0 % was illiterate, 76.22% was lower socio economic condition, discordant couple 52.60%, both parents while on HAART was 81.26%. Majority of the children were infected perinatal transmission (81.26%). The mean duration of HAAR T was 786.35 ±36.22 days, WHO stage I (4.20%), stage II(40%), StageIII (6.80%) and stage IV was (48.6 %), Malnutrion was 55.66%. Clinical associated parameters were correlated with prognosis of HAART treatment and it was positively correlated with age ($r=0.63$, $p<0.05$), duration of HAART($r=0.77$, $p<0.05$), malnutrion, BMI ($r=0.54$, $p<0.05$) and WHO clinical stage ($r=0.508$, $p<0.05$)

Table 1: Dermatological Manifestations among Study Subjects

SL.No	Lesions	Number of Children(N=72)	Percentage (%)	P-Value
I	**Infectious**	**31**	**43.1%**	**P<0.05**
01	Molluscum	09	12.5**%**	P<0.05
02	Herpes Simplex	02	2.80**%**	p>0.05
03	Herpes Zoster	03	4.20**%**	p>0.05
04	Pyoderma	03	4.20**%**	p>0.05
05	Candidiasis	07	9.70**%**	p>0.05
06	Scabies	07	9.70**%**	p>0.05
II	**Non-Infectious**	**31**	**43.10%**	**P<0.05**
07	Xerosis	09	12.50**%**	P<0.05
08	Hyperpigmentation	01	1.40**%**	p>0.05
09	Lichenoid	02	2.80**%**	p>0.05
10	Aphthous Ulcer	08	11.10**%**	p>0.05
11	Papulopruritic	11	15.30**%**	P<0.05
III	**Nil lesions**	**25**	**34.70%**	**P<0.05**

*Significant @0.05 level (p<0.05).

Table (1) showed that different dermatological manifestation with respect to infectious and Non infectious diseases. Molluscum was 09(12.50% P<0.05), Herpes Simplex 02(2.80%, p>0.05), Herpes Zoster03 (4.20%, p>0.05), Pyoderma 03(4.20%, p>0.05), Candidiasis 07(9.70%, p>0.05) and Scabies 07 (9.70, p>0.05) respectively and also the non infectious diseases patients showed the same variation (43.21%). Non infectious diseases like Xerosis was found to be

09(12.5%, P<0.05), Hyperpigmentation 01(1.4%, p>0.05),Lichenoid 02(2.8%, p>0.05), Aphthous Ulcer 08 (11.10%, p>0.05),Papulopruritic 11(15.30%, P<0.05) **and Nil lesions was 25 (**15.30%,**34.7)** graphically expressed in Figure (1A and1 B).

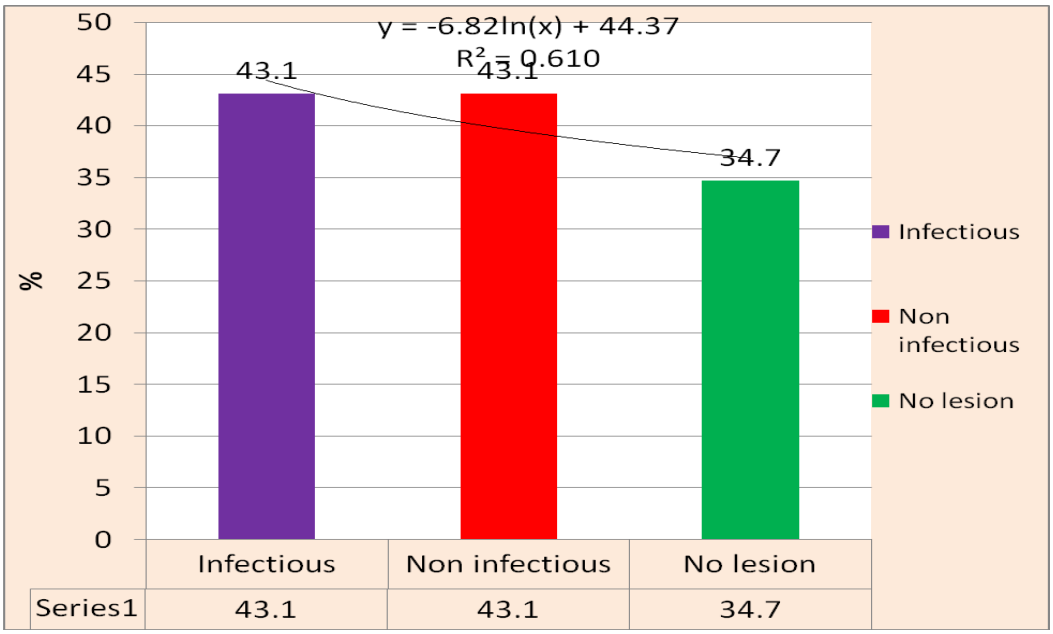


Figure 1: Dermatological Manifestations of Study Subjects

As per the study result shown that, there was statistically significant between Infectious manifestation as compared with non infectious (p<0.05). 61.0 % of the variation were found (R^2=61.0%) among children with different manifestation presented in Figure (1).

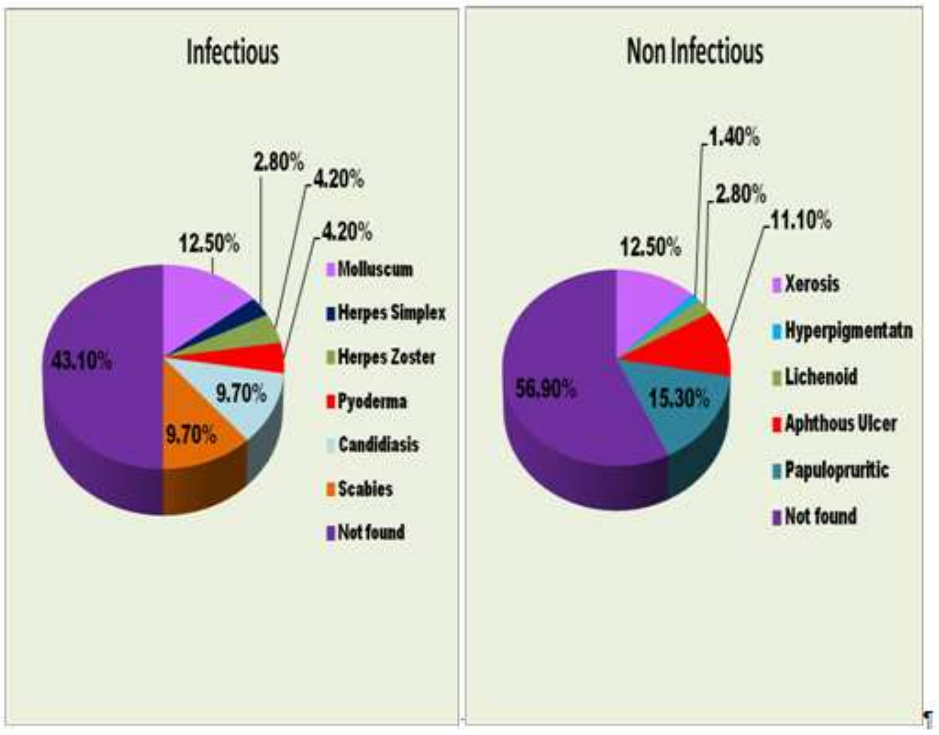


Figure 1(A) **Figure 1 (B)**

Present study revealed that, 42.9% children were in HIV stage-I (58.3%) stage-II (94.4%) stage III (75%) and stage IV. Prevalence of cutaneous disorders were increased and positively correlated with WHO clinical stage (r= 0.790, p <0.01). Infectious lesions were observed with stage-3, and it was statistically significant (p<0.005).

Table 2: Prevalence of Dermatological Lesions In Relation To CD4 Count among Study Subjects above 5yrs of Age

Lesions in Age >5 yrs	Number of Children (n=68)	CD4 COUNT µ/dL		
		<200 (n=6)	200-499 (n=15)	>500 (n=47)
Infectious-A	**28(41.2%)**	**3(50%)**	**7(46.7%)**	**18(38.3%)**
Molluscum	7(10.2%)	0(0%)	0(0%)	7(14.8%)
Herpes Simplex	2(2.9%)	0(0%)	1(6.6%)	1(2.10%)
Herpes Zoster	3(4.4%)	1(16.7%)	0(0%)	2(4.3%)
Pyoderma	3(4.4%)	0(0%)	0(0%)	3(6.4%)
Candidiasis	6(8.9%)	1(16.7%)	4(26.7%)	1(2.1%)
Scabies	7(10.2%)	1(16.7%)	2(13.4%)	4(8.4%)
Non-Infectious-B	**30(44.1%)**	**4(66.7%)**	**10(14.7%)**	**16(23.5%)**
Xerosis	9(12.5%)	1(16.7%)	4(26.7%)	4(8.5%)
Hyperpigmentation	1(1.4%)	1(16.7%)	0(0%)	0(0%)
Lichenoid	2(2.8%)	0(0%)	0(0%)	2(4.3%)
Aphthous Ulcer	8(11.1%)	1(16.7%)	3(20%)	4(8.5%)
Papulopruritic	11(15.3%)	1(16.7%)	3(20.0%)	6(12.8%)
Nil lesion	**25(34.7%)**	**2(33.3%)**	**2(13.3%)**	**21(44.7%)**

Table (2) showed that CD4 count was associated with age group of the children(>5Yrs) and it was expressed in three parameters viz., Infectious manifestation; CD4 count<200 µ/dL was 03 (50%),CD4 count between 200-499 µ/dL was 07 (46.70%) and CD4 count more than 500 µ/dL was found to be 18 (38.30%) Non Infectious; CD4 count<200 µ/dL was 04 (44.10%), CD4 count between 200-499 µ/dL was 10 (66.70%) and CD4 count more than 500 µ/dL was found to be 16 (23.50%) and lesion was not found and it could be recorded CD4 count<200 µ/dL was 02(33.30%), CD4 count between 200-499 µ/dL was 02 (13.30%) and >500 µ/dL 21 was (44.70%).

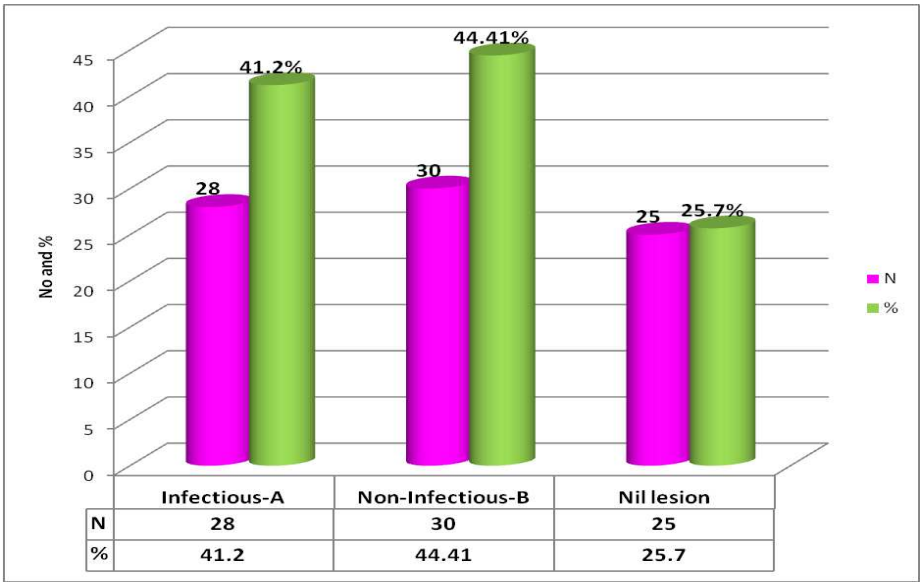
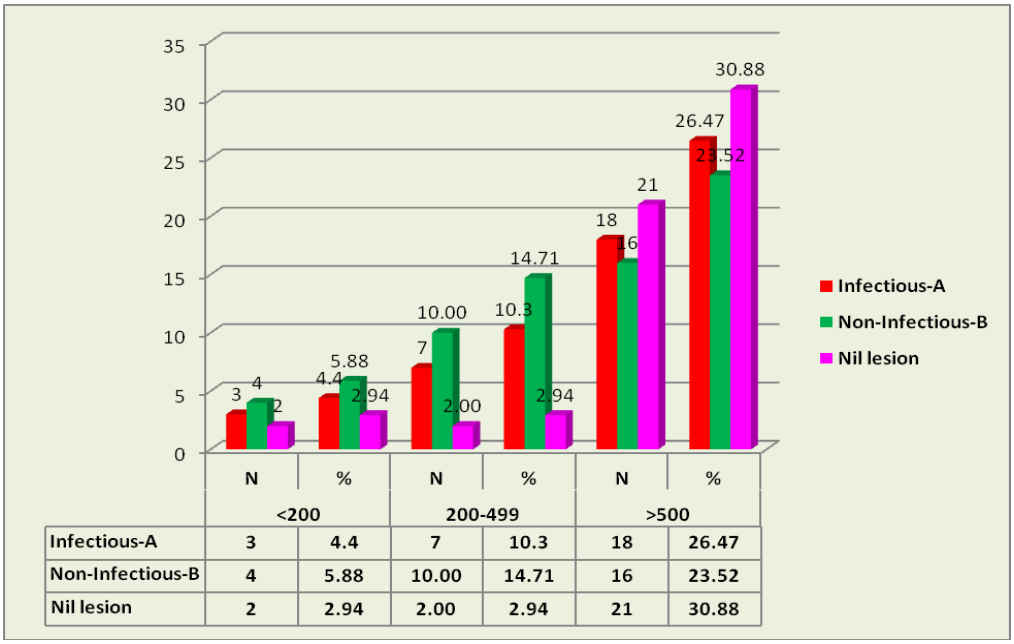


Figure 2: Percentage Variations of Dermatological Lesions



	N	%	N	%	N	%
	<200		200-499		>500	
Infectious-A	3	4.4	7	10.3	18	26.47
Non-Infectious-B	4	5.88	10.00	14.71	16	23.52
Nil lesion	2	2.94	2.00	2.94	21	30.88

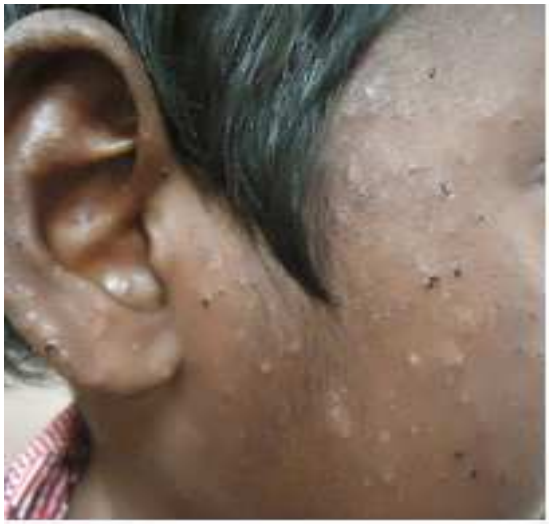
Figure 3: Skin Complications among PLHIV With Respect To CD4 Count

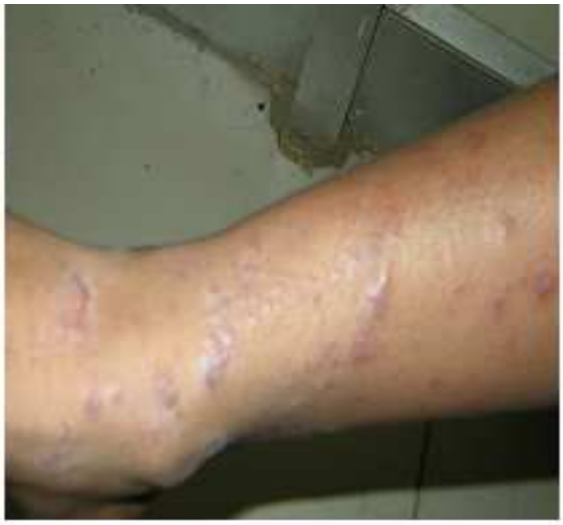
The study results showed that, the HIV infected children's were found to expressed the different manifestation with respect to CD4 count. Higher CD4 count were associated with different manifestation like Infectious (26.47%), (23.42%) and (30.88 %) respectively. The matrix of profounder parameters were positively correlated with cutaneous eruption($r=0.64, p<0.05$).

Table 3: Prevalence of Dermatological Lesions among Study Subjects in Relation to the Evidence of immunosuppression

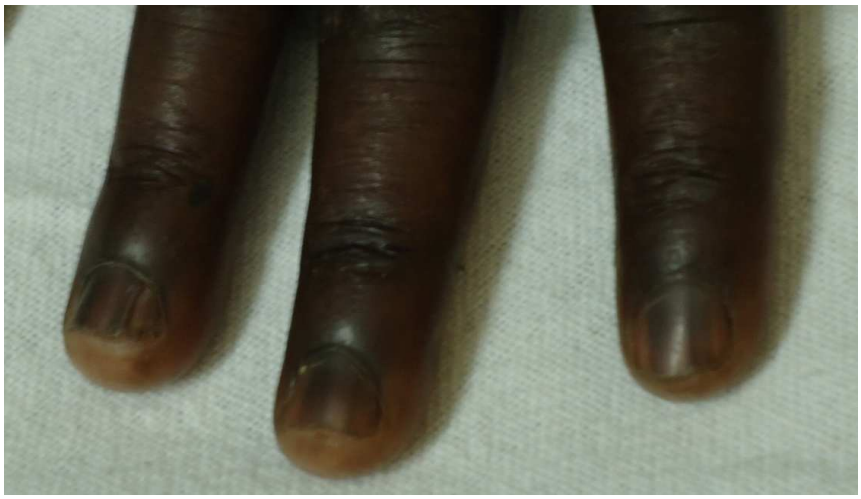
Lesions	Number of Children (n=72)	E/o immunosuppression		
		No -evidence (n=47)	Moderate (n=17)	Severe (n=8)
Infectious	**31(43.1%)**	**18(38.3%)**	**8(47.1%)**	**5(62.5%)**
Molluscum	9(12.5%)	7(14.9%)	1(5.8%)	1(12.5%)
Herpes Simplex	2(2.8%)	1(2.1%)	1(5.8%)	0(%)
Herpes Zoster	3(4.2%)	2(4.2%)	0(0%)	1(12.5%)
Pyoderma	3(4.2%)	3(6.3%)	0(0%)	0(0%)
Candidiasis	7(9.7%)	1(2.1%)	4(23.5%)	2(25%)
Scabies	7(9.7%)	4(8.5%)	2(11.76%)	1(12.5%)
Non-Infectious	**31(43.1%)**	**16(34.1%)**	**11(64.7%)**	**4(50.0%)**
Xerosis	9(12.5%)	4(8.5%)	4(23.5%)	1(12.5%)
Hyperpigmentation	1(1.4%)	0(0%)	0(0%)	1(12.5%)
Lichenoid	2(2.8%)	2(4.3%)	0(0%)	0(0%)
Aphthous Ulcer	8(11.1%)	4(8.5%)	3(17.6%)	1(12.5%)
Papulopruritic	11(15.3%)	6(12.8%)	4(23.5%)	1(12.5%)
Nil lesion	**25(34.7%)**	**21(44.7%)**	**2(11.8%)**	**2(25%)**

As per table, 65.3% subjects with no evidence of immunosuppression, 88.2% subjects with moderate evidence of immunosuppression and 75% subjects with severe evidence of immunosuppression had dermatological lesions The prevalence of cutaneous disorders increased as the degree of immunosuppression increased, which was statistically significant ($p = 0.008^{**}$). Increased prevalence of infectious lesions were associated with severe degree of immunosuppression with probable significance ($p=0.072$)





Lichenoid eruption(CD4 count <150) **Papulopruro dermatoses(CD4 count 150-200)**



Nail Hyperpigmentation (CD4 Count <50)

DISCUSSIONS

The advent of HAART has changed the spectrum of skin disorders by improving host immunity, which in turn reduces the occurrence of infectious and non infectious skin complications 4. However, the restoration of immunity may cause flare-up of different skin manifestation. HIV-infected children are more likely prone to the adverse ARV drug reactions than the general population. HAART, with no exception, carries the risk in causing mucocutaneous adverse reactions [5]. One of the commonly encountered problems in HAART era in India is the protease inhibitor (PI)-induced Infectious manifestation like ; Molluscum, Herpes Simplex, Herpes Zoster Pyoderma, Candidiasis, Scabies. Noninfectious; Xerosis, Hyperpigmentation, Lichenoid, Aphthous Ulcer, Papulopruritic and lipodystrophy which is characterized by loss of buccal fat, thinning of extremities and buttocks, central adiposity, dorsocervical fat pad ("buffalo hump") and gynaecomastia. Highly active antiretroviral therapy (HAART) appears to preserve cardiac function in children and adolescents infected with HIV, many authors found that inception of HAART at lower CD4 count are more expressed dermatological complications [3] Infectious dermatoses was the most common lesion, contributing to 87% of cases. The cutaneous lesions were most commonly observed in children belonging to stage -III (94%), followed by stage -IV (75%)[2]. The matrix of present study was documented inception of HAART at lower base line CD4 count (200µ/Dl),

malnutrion, WHO clinical stage III & IV and lower economic status were considered for variants of dermatological complications.

Decreased immune function in the skin is correlated with many HIV-related infectious and non-infectious skin diseases (12). The CD4 cells are seriously impacted by HIV infection, As HIV infection progresses, skin diseases gradually become more aggressive and widespread throughout the body, with a higher rate of recurrence and refractory disease (14). Therefore, HIV/AIDS-related skin lesions are often important indicators for the clinician as to the presence of HIV infection and the development of AIDS. Some infectious infectious Molluscum, Herpes Simplex, Herpes Zoster Pyoderma, Candidiasis, Scabies. Noninfectious ; Xerosis, Hyperpigmentation, Lichenoid, Aphthous Ulcer, Papulopruritic were seen in patients with severe immunosuppression (CD4+ count, < 150/µl). Molluscum and xerosis was observed in patients at all stages of HIV infection with frequent recurrence of lesions and post-herpetic neuralgia. The extent and severity of recurrence was correlated with immune status where patients with clinical AIDS sometimes had disease in bilateral peripheral nerves.

CONCLUSIONS

The overall study indicates that, the HIV infected children's are more easily susceptible to skin disorders with inception of HAART at lower CD4 count (< 200 µ/Dl). Clinical examination is very much required for HIV infected children as their immune systems drops. Early initiation of HAART, maintenance of better CD4 count, lack of malnutrition and cleanliness are the important factors to be taken care in HIV infected children's. The most common dermatological manifestation seen is Molluscum, Xerosis and Papulopruritic.

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REFERENCES

1. UNAIDS report on the Global AIDS Epidemic 2010
2. Tony Burns, Stephen Breathnach, Neil Cox, Cristopher Griffiths. Rook's text book of Dermatology, 7th edn, Blackwell publishing, pg 26.11
3. Bhushan Kumar & Somesh Gupta, Sexually Transmitted Infections: Printed in India, 2006, Elsevier Publishers, Pg 63-66,673-693,785-799.
4. Bernard Rosner (2000), Fundamentals of Biostatistics, 5th Edition, Duxbury, page 80-240
5. Robert H Riffenburg (2005), Statistics in Medicine, second edition, Academic press. 85-125.
6. Sunder Rao P S S, Richard J : An Introduction to Biostatistics, A manual for students in health sciences, New Delhi: Prentice hall of India. 86-160
7. John Eng (2003), Sample size estimation: How many Individuals Should be Studied?. Radiology 227: 309-313
8. Millembe F Panya, Yassin M Mgonda, and Augustine W Massawe. The pattern of mucocutaneous disorders in HIV – infected children attending care and treatment centres in Dar es Salaam, Tanzania. BMC Public Health.

2009 july (9): 234.[pubmed]

9. Pol RR, Shepur TA, Ratageri VH, Clinico-laboratory profile of pediatric HIV in Karnataka. Indian J Pediatr. 2007 Dec; 74(12):1071-5
10. Purnima Madhivanan, S.N.Mothi, N. Kumarasamy, T. Yepthomi, C. Venkateshan, John S. Lambert and Suniti Solomon. Clinical manifestations of HIV infected children. Indian Journal of Pediatrics, August, 2003, 70(8).
11. Sunil gomber, Jaya shankar kaushik, Jagdish chandra and Rahul anand. Profile of HIV Infected Children from Delhi and Their Response to Antiretroviral Treatment. Indian paediatric september 2011,48, 704-707
12. Kumarasamy, Nagalingeswaran MD; Solomon, Suniti MD; Madhivanan, Purnima MD; Ravikumar, Balakrishnan MD; Thyagarajan, Sandras Panchatcharam MD; Yesudian, Patrick MD. Dermatological manifestations among human immunodeficiency virus patients in South India International Journal of Dermatology, March 2000, 192-195.
13. Shilpa R. Shah, Milind S. Tullu, Jaishree R. Kamat. Clinical Profile of Pediatric HIV Infection from India, Archives of Medical Research, jan 2005, 36 (1), 24-31
14. Wananukul, Siriwan M.D.; Deekajomdech, Tawatchal M.D.; Opanchareon, Chitsanu M.D.l; Thisyakom, Usa M.D. Mucocutaneous Findings in Pediatric AIDS Related to Degree of Immunosuppression.Pediatric Dermatology Current Issue Archive, July/August 2003.289-294.
15. Ruela, E. Seoane; Bellon, J. M.;Gurbindo, D; Munoz-Fernandez, M.A. Role of antiretroviral therapies in mucocutaneous manifestations in HIV infected children over a period of two decades. British Journal of Dermatology Current Issue Archive. 153 (2).382-389.
16. Donic I, Vesic S, Jertoric DJ. Oral candidiasis and seborrheic dermatitis in HIV infected patients on highly active antiretroviral therapy. HIV medicine. 2004;5:50. doi: 10.1111/j.1468-1293.2004 [PubMed] [Cross Ref]

APPENDICES

APPENDIX

AIDS	Acquired Immunodeficiency Syndrome
ART	Anti retroviral therapy
AU	Aphthous ulcer
AZT	Zidovudine
CD4	Cluster differentiaition
CDC	Centre for Disease Control
ELISA	Enzyme linked immune sorbent assay
HIV	Human immunodeficiency virus
HS	Herpes simplex
LE	Lichenoid eruption
MC	Molluscum contagiosum
NH	Nail hyperpigmentation
PPD	Papulopruritic dermatoses
VZ	Varicella zoster