Original Article

Effect of antiretroviral therapy on mucocutaneous manifestations among Human Immunodeficiency Virus-infected patients in a tertiary care centre in South India

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Abstract

Background: Human Immunodeficiency Virus (HIV) infection produces a wide range of infectious and noninfectious dermatoses which correlate with the degree of immunodeficiency. Since the introduction of highly active antiretroviral therapy (HAART), there has been a dramatic decrease in the incidence of HIV-associated dermatoses. However, HAART itself causes various cutaneous adverse drug reactions. **Aims:** To assess the various mucocutaneous manifestations in HIV-infected individuals and its association with CD4 count and to assess the effect of HAART on mucocutaneous manifestations. **Materials and Methods:** Of the 170 patients recruited, 110 patients were previously diagnosed with HIV and were on follow-up. The rest 60 patients were newly diagnosed cases at recruitment, and these patients were followed up every month for mucocutaneous manifestations for a period of 6 months. **Results:** Of the 170 patients screened, 69.41% patients had at least one mucocutaneous lesion at presentation. Fungal, viral, and bacterial infections were observed present in 17.6%, 10.6%, and 9.4% patients, respectively. There was a significant difference in the occurrence of candidal infections in the HAART versus non-HAART group ($P = 0.0002$). Candidiasis ($P \leq 0.0001$) and human papillomavirus infection ($P = 0.0475$) occurred more commonly with CD4 count <200 cells/mm^3. Among the noninfectious dermatoses, inflammatory dermatoses (17.6%) were more commonly observed at recruitment followed by adverse cutaneous drug reactions (16.5%) and neoplasms (5.3%). **Conclusion:** HAART has significantly altered the patterns of mucocutaneous manifestations. The prevalence of both infectious and inflammatory dermatoses has come down. However, there is an increase in the incidence of adverse cutaneous drug reactions.

Key words: Antiretroviral therapy, CD4 count, Human Immunodeficiency Virus infection, mucocutaneous manifestations

INTRODUCTION

Human Immunodeficiency Virus (HIV) is nearly 33 years old and dermatological manifestations occur throughout the course of HIV infection ranging from the maculopapular rash seen with acute primary HIV infection/seroconversion to the disseminated mycoses

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and malignancies seen with advanced disease. These mucocutaneous lesions usually correlate with the degree of immunodeficiency.

Following the introduction of highly active antiretroviral therapy (HAART) since 1996, there has been a dramatic decrease in the incidence and severity of HIV-associated dermatoses. The pervasive use of HAART may also have changed the patterns and rates of HIV-related cutaneous manifestations.[1] Although, mucocutaneous lesions have diminished in their frequency following the introduction of HAART, the therapy itself can lead to increased incidence of adverse cutaneous drug reactions.[2] Hence, we undertook this study to study the various mucocutaneous manifestations encountered in treatment-naïve HIV-infected individuals and those on HAART.

MATERIALS AND METHODS

This was a hospital-based descriptive study done in HIV-infected patients attending antiretroviral therapy (ART) clinic, Suraksha clinic (Sexually Transmitted Diseases Clinic) and Dermatology Outpatient Department, JIPMER, Puducherry from November 2012 to May 2014, after obtaining Institute Ethics Committee clearance (IEC/SC/2012/4/113).

One hundred and seventy HIV seropositive patients irrespective of gender, age were included in the study. Among them, 110 patients were previously diagnosed with HIV and were on follow-up for 6 months. Of these, 100 patients were already initiated on HAART (mean duration of HAART 4.9 years ranging from 4 months to 25 years) and the rest 10 were not on HAART. The rest 60 patients were newly diagnosed cases at recruitment, and these patients were followed up every month for mucocutaneous manifestations for a period of 6 months. Of these 60 patients, 48 patients received HAART [Flow Diagram 1].

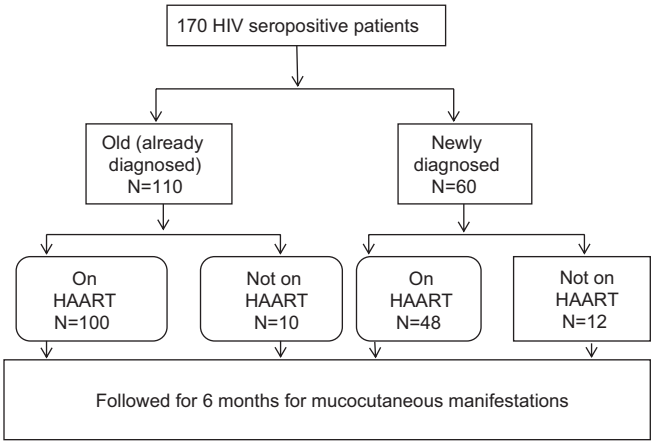
The diagnosis was made based on history, clinical examination, and laboratory investigations (KOH, Tzanck, and biopsy) wherever necessary. The CD4 count was done for all the patients at recruitment and after 6 months.

Statistical analysis

The data collected were tabulated in Microsoft Excel Worksheet, and computer-based analysis was performed using the IBM SPSS (software package for statistical analysis) 20 software (USA). The categorical variables were summarized as proportions and percentages. The continuous variables were summarized as a mean and standard deviation. For comparison of means, unpaired *t*-test was used for two groups. For comparison of proportions, Fisher's exact test, one-way ANOVA, and McNemar's test were used.

RESULTS

The mean age of the study population was 39.88 ± 9.44 years (ranging from 11 to 65 years with a median of 38 years). There was no gender predilection and the male to female ratio was 1.04:1. The demographic characteristics of the 170 HIV-positive patients are depicted in Table 1.



Flow Diagram 1: Status of the Human Immunodeficiency Virus seropositive cases at the time of recruitment and follow-up

Table 1: Demographic characteristics of the 170 HIV-positive patients in our study

Patient characteristics	Total number of patients (*n*=170) (%)
Gender	
Males	87 (51.2)
Females	83 (48.8)
Marital status	
Married	112 (65.9)
Single	19 (11.2)
Widowed	39 (22.9)
Occupation	
House wife	54 (31.8)
Farmer	37 (21.8)
Construction worker	9 (5.3)
Driver	6 (3.5)
Unskilled workers	42 (24.8)
Mode of acquisition	
Sexual	152 (89.4)
Blood	5 (2.9)
Vertical	1 (0.6)
Unknown	10 (5.9)
Sexual orientation	
Heterosexual	154 (90.6)
Homosexual	3 (1.8)
Bisexual	2 (1.2)

HIV=Human Immunodeficiency Virus

Pulmonary tuberculosis was the most common form of tuberculosis (29 patients, 17.1%). Extrapulmonary tuberculosis was seen in 22 patients (13%).

WHO clinical staging

Most (78 patients; 45.9%) of our patients were in WHO clinical stage 3 during the initial diagnosis. Forty-two patients (24.7%) each was in stage 1 and 4.

Highly active antiretroviral therapy regimen

The first line ART, zidovudine (AZT) + lamivudine (3TC) + nevirapine (NEV) was initiated in 101 patients (69.2%). Twenty-four patients (16.4%) were started on AZT + 3TC + efavirenz (EFV) due to co-infection with tuberculosis. Twenty patients were started on stavudine based regimen due to anemia. Other 3 patients were on tenofovir + 3TC + EFV.

Mucocutaneous manifestations of the Human Immunodeficiency Virus infected cases

Of the 170 HIV-infected patients screened, 118 (69.41%) patients had at least one mucocutaneous lesion at presentation. Among the infectious dermatoses, fungal infections were the most commonly observed infections present in 30 (17.6%) patients. Viral infections were observed in 18 (10.6%) patients [Figure 1] and bacterial infections in 16 (9.4%) patients [Figure 2]. A mean number of dermatoses was 1.2/patient. On follow-up of these 170 patients, the mean number of dermatoses increased to 1.75/patient during the entire study period.

Infectious dermatoses

The various infectious dermatoses observed in patients on HAART and not on HAART are provided in Table 2. Most of the infections had a higher prevalence in patients who did not receive HAART. However, this was significant in the case of fungal infections (11% vs. 27.1%, *P*: 0.0081).

The most common infection observed in our study was oral candidiasis, the pseudomembranous type being the most frequently observed. There was a significant difference in the occurrence of candidal infections in the HAART versus non-HAART group ($P = 0.0002$) but there was no significant difference in any of the viral or bacterial infections. Viral infections were more common in the HAART group.

Table 2: Infectious dermatoses of patients who were on HAART (100 cases) and not on HAART (70 cases) at presentation

Mucocutaneous manifestations	On HAART *n* (%)	Not on HAART *n* (%)	*P*
Infections	26 (26)	30 (42.9)	0.03
Fungal	11 (11)	19 (27.1)	0.008
Candidiasis	3 (3.0)	15 (21.4)	0.0002
Tinea versicolor	1 (1.0)	1 (1.4)	1.00
Tinea corporis	5 (5.0)	2 (2.9)	0.70
Onychomycosis	3 (3.0)	3 (4.3)	0.69
Viral	10 (10)	8 (11.4)	0.80
HPV infection	4 (4.0)	6 (8.6)	0.32
Herpes simplex	4 (4.0)	-	0.14
Herpes zoster	2 (2.0)	-	0.51
MC	1 (1.0)	2 (2.9)	0.56
OHL	-	1 (1.4)	0.41
Bacterial	6 (6.0)	10 (14.3)	0.10
Pyoderma	3 (3.0)	3 (4.3)	0.69
Bacterial vaginosis	1 (1.0)	3 (4.3)	0.30
Syphilis	1 (1.0)	1 (1.4)	1.00
Parasitic			
Scabies	1 (1.0)	2 (2.9)	0.56

HAART=Highly active antiretroviral therapy; HPV=Human papillomavirus; MC=Molluscum contagiosum; OHL=Oral hairy leukoplakia

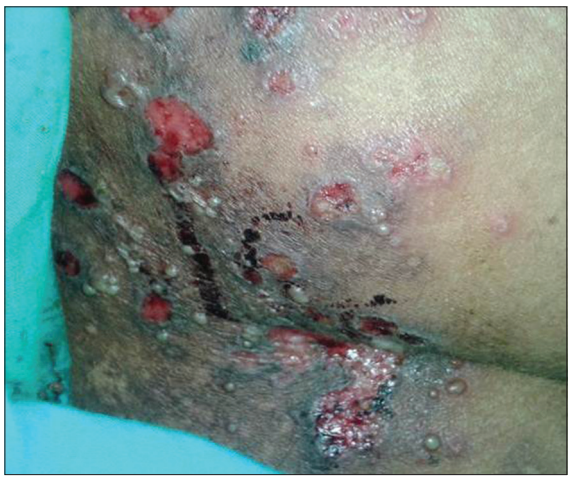


Figure 1: Chronic herpes simplex presenting as multiple vesicular and ulcerative lesions in perianal area

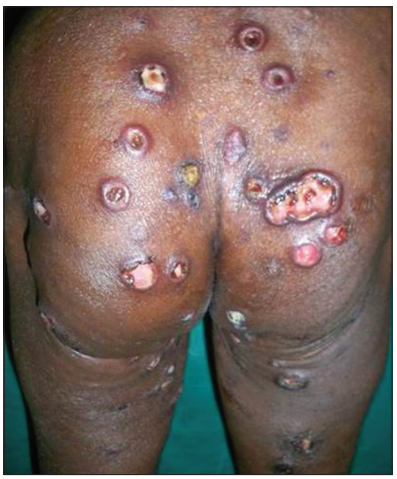


Figure 2: Secondary syphilis - multiple nodulo-ulcerative lesions distributed in trunk and extremities

Infectious dermatoses and mean CD4 correlation

The CD4 count was significantly lower in those who had candidiasis and verruca vulgaris compared to those without these infections. The comparison of mean CD4 count of patients with and without infectious dermatoses is presented in Table 3.

Noninfectious dermatoses

Among the noninfectious dermatoses, inflammatory dermatoses (30 patients, 17.6%) were more commonly observed at recruitment followed by adverse cutaneous drug reactions (28 patients, 16.5%) and neoplasms (9 patients, 5.3%). The comparison of noninfectious dermatoses of patients who were on HAART and not on HAART is depicted in Table 4.

At recruitment 28/170 (16.5%) patients had at least one adverse cutaneous drug reaction. The most common adverse effect noted was AZT induced longitudinal melanonychia [Figure 3] and nail pigmentation (9 patients, 5.3%). Seven patients (4.1%) had stavudine induced lipoatrophy, and they were shifted to AZT based regimen. Two patients with NEV induced maculopapular rash and 1 patient with the drug hypersensitivity syndrome were then shifted to EFV based regimen. AZT induced oral lichenoid drug eruption (OLDR) [Figure 4] was observed in 4 patients (2.3%). A case of photosensitive lichenoid eruption was seen in a patient who was on AZT for 3 years.

Noninfectious dermatoses and mean CD4 count correlation

Pruritic papular eruption (PPE) was significantly associated with lower mean CD4 count (194.64 ± 122.04 cells/mm^3) compared with those who were not having PPE (P = 0.001). OLDR was significantly more in patients with higher CD4 count (626.00 ± 129.75 cells/mm^3). The CD4 count correlation of noninfectious dermatoses is tabulated in Table 5.

Clinical manifestations and CD4 correlation of patients who were newly diagnosed at recruitment

Of the 60 newly diagnosed patients, 48 patients were started on ART and followedup for 6 months. The results are tabulated in Table 6.

Before starting HAART, infections were more common (24 patients, 50%). Among them, candidiasis was the most common infection seen in 14 patients (29.2%). Among the inflammatory dermatoses, PPE was more common

Table 3: Comparison of mean CD4 count of patients who were having and not having infectious dermatoses

Mucocutaneous manifestations	*n* (%)	Mean CD4 count of those having infections (cells/mm^3)	Mean CD4 count of those not having infections (cells/mm^3)	*P*
Infections	56 (32.9)	247.46±193.09	367.00±233.28	0.002
Fungal	30 (17.6)	189.84±134.58	354.22±232.21	<0.0001
Candidiasis	17 (10.6)	120.82±75.73	353.19±226.82	<0.0001
Dermatophytosis	7 (4.1)	251.00±120.88	330.26±229.80	0.44
Viral	18 (10.36)	245.27±218.30	338.54±227.02	0.10
Herpes simplex	4 (2.4)	405.00±391.67	325.66±223.20	0.71
Verucca vulgaris	6 (3.5)	138.33±54.66	335.33±228.37	<0.0001
MC	3 (1.8)	75.33±63.53	332.69±226.61	0.05
Bacterial	16 (19.4)	276.33±222.00	333.21±227.96	0.35
Pyoderma	6 (3.6)	403.00±339.23	325.20±223.87	0.45

MC=Molluscum contagiosum

Table 4: Noninfectious dermatoses of patients who were on HAART (100 cases) and not on HAART (70 cases) at presentation

Mucocutaneous manifestations	Number of patients (%)		*P*
	On HAART	Not on HAART	
Inflammatory	13 (13)	17 (24.3)	0.06
Pruritic papular eruption	9 (9.0)	7 (10.0)	1.00
Seborrheic dermatitis	-	3 (4.3)	0.06
Neoplasm	3 (3.0)	6 (8.6)	0.16
NHL	-	2 (2.9)	0.16
Kaposi's sarcoma	-	2 (2.9)	0.16
Squamous cell carcinoma penis	2 (2.0)	1 (1.4)	1.00
Adverse drug reactions	26 (26.0)	1 (1.4)	<0.0001
Lipodystrophy	7 (7.0)	-	0.04
Maculopapular rash	4 (4.0)	-	0.02
Longitudinal melanonychia/ nail pigmentation	9 (9.0)	-	0.02
Oral lichenoid eruption	4 (4.0)	-	0.14
Miscellaneous	21 (21.0)	13 (18.2)	-
Hair loss	6 (6.0)	3 (4.3)	0.73
Melasma	4 (4.0)	1 (1.4)	0.64
Chronic paronychia	2 (2.0)	1 (1.4)	1.00

HAART=Highly active antiretroviral therapy; NHL=Non-Hodgkin's lymphoma

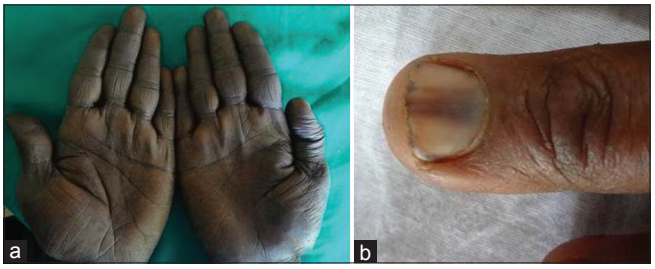


Figure 3: (a) Zidovudine induced pigmentation affecting palms. (b) Zidovudine induced longitudinal melanonychia

(6 patients; 12.5%). After starting HAART, the prevalence of infections and inflammatory dermatoses had come down with a significant reduction in fungal infections ($P = 0.007$).

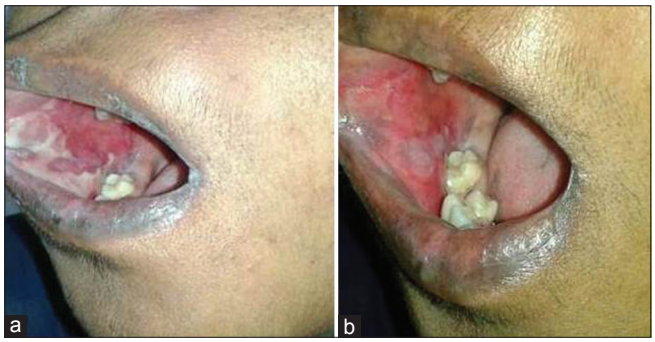


Figure 4: (a) Zidovudine induced lichenoid eruption affecting buccal mucosa. (b) Resolution of oral lichenoid eruption after changing zidovudine to tenofovir

Table 5: Comparison of mean CD4 count of patients who were having versus those not having noninfectious dermatoses

Mucocutaneous manifestations	*n* (%)	Mean CD4 count of those having skin lesions (cells/mm³)	Mean CD4 count of those not having skin lesions (cells/mm³)	*P*
Inflammatory	30 (17.6)	240.53±218.43	346.92±225.54	0.02
Pruritic papular eruption	16 (9.4)	194.64±122.04	340.00±231.32	0.001
Seborrheic dermatitis	3 (1.8)	73.66±35.47	332.72±226.66	0.05
Neoplasm	9 (5.3)	278.37±206.58	330.29±228.73	0.53
Adverse cutaneous drug reactions	18 (16.5)	377.00±151.09	317.30±239.49	0.10
Oral lichenoid drug eruption	4 (2.4)	626.00±129.75	319.00±224.23	0.007

The baseline CD4 count of 30/48 patients (62.5%) was <200 cells/mm³ while 15 patients had a CD4 count in the range of 200–350 cells/mm³. After initiation of HAART, at the end of 6 months only 8 patients had CD4 count <200 and 21 patients had CD4 count more than 200 cells/mm³.

Among the 12 patients whom ART was not initiated during the study period, 2 patients died due to malignancy at the time of diagnosis. Two patients were lost to follow-up. Rest 8 patients had baseline CD4 count more than 400 cells/mm³. Among them, 2 patients had condyloma acuminata at the time of diagnosis. During follow-up, none of them developed any new infections.

Mortality

Three patients died during the follow-up. Two out of three patients had non-Hodgkin's lymphoma (NHL) in which 1 patient was on HAART. The third one had Kaposi's sarcoma (KS) in an Indian patient, and he was not on HAART.

DISCUSSION

Dermatological manifestations are not only common but are often a presenting feature of HIV infection, often correlating with the degree of immunodeficiency. The increasing severity and atypical presentation of these dermatological conditions characterize HIV co-infection. After the introduction of HAART therapy, there is a significant decrease in the prevalence of infectious dermatoses and AIDS-defining illnesses (like esophageal candidiasis, chronic herpes simplex [HS], and deep fungal infections). However, there is a parallel increase in the mucocutaneous adverse effects due

Table 6: Mucocutaneous manifestations and CD4 count of 48 HIV-infected new patients

Mucocutaneous manifestations	*n* (%) before HAART	*n* (%) after HAART	Mean CD4 before HAART (cells/mm³)	Mean CD4 after HAART (cells/mm³)	*P*
Infections	24 (50)	11 (22.9)	147.08±100.81	238.22±95.99	0.0001
Fungal	16 (33.3)	5 (10.4)	141.56±107.76	171.40±42.08	0.007
Candidiasis	14 (29.2)	4 (8.3)	112.50±77.66	179.25±44.16	-
Viral	6 (12.5)	3 (6.3)	115.00±50.15	367.00±0.00	0.50
HPV	4 (8.4)	-	138.75±43.76	-	-
Molluscum contagiosum	2 (4.2)	-	106.50±47.37	-	-
Bacterial	8 (16.7)	3 (6.2)	150.63±89.63	306.67±82.65	0.22
Pyoderma	2 (4.2)	3 (6.3)	113.00±82.65	306.67±82.65	-
Bacterial vaginosis	3 (6.3)	-	110.00±34.04	-	-
Inflammatory	15 (31.2)	6 (12.5)	136.87±102.93	233.71±89.00	0.05
Pruritic papular eruption	6 (12.5)	5 (10.4)	129.50±99.64	255.80±94.91	1.00
Seborrheic dermatitis	3 (6.3)	-	73.67±35.47	-	-
Adverse drug reactions	-	5 (10.4)	-	281.80±102.95	0.25
Longitudinal melanonychia/nail pigmentation	-	2 (4.2)	-	310.00±150.53	-

HAART=Highly active antiretroviral therapy; HIV=Human immunodeficiency virus; HPV=Human papillomavirus

to drugs in the post-HAART era. Thus, HAART has significantly altered the pattern of mucocutaneous manifestations occurring in HIV patients.

The demographic characteristics of our study showed no gender predilection whereas previous studies showed a male predominance.[3] This may be attributed to increasing health seeking behavior among the female population. Mean dermatoses in our study population at recruitment were 1.2/patient. In our study, we followed up the patient for 6 months and found mean dermatoses increased to 1.75/patient. This reiterates the fact that drug eruptions showed an increasing trend in the post-HAART era.

Infectious dermatoses are the most common skin manifestations in HIV. In the present study, however only 32.9% patients had infectious dermatoses while 39.1% had noninfectious dermatoses. Though fungal infections were the most common infections occurring in 30 patients (17.6%) followed by viral (10.6%) and bacterial (9.4%) infections in our study, the overall prevalence is low compared to previous studies in the literature.[1,2] This could be attributed to the fact that most of our patients were on HAART.

Oral candidiasis (pseudomembranous type) is the most common mucocutaneous manifestations observed in various studies prior to the administration of HAART which was also the case in our study. The mean CD4 count of patients with candidiasis (120 cells/mm^3) was significantly low compared to those without candidiasis as observed in previous studies wherein candidiasis occurred with low CD4 count (<200 cells/mm^3).[1,4]

The most common viral infection noted was human papillomavirus infection, seen in 10 (5.9%) patients. The mean CD4 count of patients with verruca vulgaris was significantly low compared to those without verruca. Among the sexually transmitted infections, anogential warts were the most common manifestation in a study done by Chopra and Arora[5] similar to our study wherein we observed 2.4% patients having condyloma acuminata. Condyloma acuminata occurred with a mean CD4 count of 320 cells/mm^3 in the study population. There are conflicting reports in the literature regarding correlation of CD4 count and condyloma acuminata. While Kim *et al*.[6] found that condyloma acuminata was more prevalent in the patients with a CD4 count >200cells/mm^3, Goldstein *et al*.[7] observed condyloma acuminata with advanced immunosuppression (CD4 < 75 cells/mm^3). Hence, it can be inferred that condyloma acuminata can occur in patients with normal CD4 count.

HS and herpes zoster (HZ) occur due to reactivation of latent infection during immunodeficiency. HZ is usually unidermatomal in HIV.[8] But multidermatomal, disseminated and atypical presentations like necrotic, hemorrhagic and hyperkeratotic lesions do occur in HIV. Though we observed cases of HZ occurring in multidermatomal pattern and as immune reconstitution inflammatory syndrome (IRIS) manifestations, the prevalence was much lower than that reported by previous study[2] since, most of our patients were on HAART. These findings support the role of HAART in increasing the immunity in HIV-infected patients. HS and molluscum contagiosum (MC) usually occur with lower CD4 count (<200 cells/mm^3).[9] Although, MC occurred with lower mean CD4 count (75.33 ± 63.53 cells/mm^3) in our study, we found HS to be occurring in those with a higher mean CD4 count (405.00 ± 391.67 cells/mm^3) in contrast to other studies.[1,9]

Staphylococcus aureus was the most common pathogen implicated in cutaneous and systemic bacterial infection in HIV-infected patients[5,8] which was also observed in our study.

The prevalence of noninfectious dermatoses in our study was 39.1% which is similar to a study done in China.[2] The spectrum of inflammatory dermatoses seen in HIV varies from PPE, seborrheic dermatitis (SD), and ichthyosis, psoriasis to reactive arthritis. PPE presents as pruritic papules in the face and exposed sites of extremities. Although the pathogenesis is poorly understood, it is said to occur as a hypersensitive response to insect bites. In our study, PPE was the most common inflammatory dermatoses observed and was significantly associated with lower mean CD4 count (194.64 ± 122.04 cells/mm^3) similar to a previous study.[1] The increased prevalence may be due to poor socioeconomic conditions in our region in which patients are prone to arthropod bites.

SD presents with increased severity varying with the stage of immunodeficiency.[8] It is one of the most common noninfective dermatoses of HIV, as observed by Jensen *et al*.[10] who reported SD in 49.2% patients. However, in our study, only 1.8% (3 patients) had SD probably because most of our patients were on HAART at recruitment. It occurred with a mean CD4 count of 76.33 cells/mm^3 in 3 patients.

One of the causes of acquired ichthyosis is AIDS. The prevalence of acquired ichthyosis and xerosis in other studies range from 5% to 10%[3,9], and initiation of ART reduces the symptoms of ichthyosis.[11] In our study, population where most of them were on HAART, ichthyosis/xerosis was found in only 3.5% patients and among them only 1 patient had generalized ichthyosis.

AIDS-associated KS presents as widespread cutaneous lesions which may disseminate to involve internal organs and is the most frequent tumor in sub-Saharan African countries.[12,13] In a study done on cutaneous manifestations of HIV 15 years back in our institute no cases of KS was observed.[14] Similarly, there are only sparse case reports of KS from India. However in the current study, we observed 2 patients with KS. Both cases had disseminated KS. NHL and squamous cell carcinoma were observed in 4 patients each. In the present study, various presentations of NHL observed were chronic ulceration in the axilla with lymphedema, parapharyngeal mass, nodulo-ulcerative lesions, and generalized lymphadenopathy. We had two cases of invasive squamous cell carcinoma cervix. Hence, regular screening for HIV-infected women for cervical malignancies by Pap smear should be emphasized.

Drug rashes such as a maculopapular rash, erythema multiforme, drug hypersensitivity syndrome, Stevens-Johnson syndrome, toxic epidermal necrolysis, and hyperpigmentation are common in HIV patients.[15] Reactivation of Epstein-Barr virus and cytomegalovirus, glutathione depletion, immune dysregulation like an increase in IgE secreting B cells and increased usage of drugs (polypharmacy) may predispose to increased incidence of a drug reaction in HIV. Adverse cutaneous drug reactions are not only more common but also severe in HIV-infected individuals.[16] They are the most common side effects seen in patients who were started on HAART (especially NNRTI) within 8.3 months in a study done by Huang *et al*.[2]

In our study, adverse reaction to drugs was observed in 28 patients (16.5%). We found longitudinal melanonychia and nail pigmentation (5.2%) as the most common nail change in patients who were on AZT. Stavudine induced lipoatrophy was found in only 4.1% patients whereas Sharma *et al*.[17] observed it in 14.5% patients. This was probably due to the predominant initial regimen in our study being AZT based (85.6%).

In the study done by Sreenivasan and Dasegowda[18] 14% of cases required modification of first-line regimen with NEV induced skin rash being the most common reason. In our study, 3% of patients required regimen change due to NEV induced rash. OLDR was seen in four patients with higher CD4 count (626.00 ± 129.75 cell/mm^3), and there was statistically significant difference in mean CD4 count (P = 0.007). Previously, Arirachakaran *et al*.[19] had reported a case of oral lichenoid eruption that has resolved after stopping AZT. In our study also, we observed the resolution of persistent OLDR on shifting a patient from AZT to tenofovir based regimen.

IRIS is characterized by paradoxical worsening of existing clinical condition or appearance of a new disease following HAART. In the current study, 2 patients had developed IRIS presenting as HZ. Though HIV viral load was not done, both the patients had a significant increase in CD4 count from baseline.

CONCLUSION

Mucocutaneous manifestations are common problems encountered in the HIV-infected patients where infectious dermatoses predominated in the pre-HAART era. After the introduction of HAART, there is a significant alteration in the patterns of mucocutaneous manifestations. The prevalence of both infectious and inflammatory dermatoses has come down. But there is an increase in the incidence of adverse cutaneous drug reactions.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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