Trends in Clinical and Medical Sciences

PSR Press

*Article*

# Mucocutaneous manifestations among patients with HIV infection: A hospital based study from east India

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Academic Editor: Dr. Ajay Verma
Received: 15 December 2022; Accepted: 8 February 2023; Published: 31 March 2023.

**Abstract: Background:** Mucocutaneous lesions are the most prevalent sign of HIV infection and serve as the first clue that HIV is present. They are important indications of a patient's immunological health, and HIV-infected patients typically experience more severe, unusual, and extensive symptoms.
**Objectives:** To investigate the prevalence and spectrum of mucocutaneous manifestations in patients with HIV infection, and to determine the relationship between these manifestations and CD4 cell counts as an indicator of immunological health.
**Materials and Methods:** The study was conducted at a tertiary care Medical College and Hospital in Cuttack. Patients were enrolled from two centers, the Dermatology outdoor and Anti Retro Viral Therapy Centre, within the hospital. The mucocutaneous manifestations were classified, and CD4 cell counts were determined through collected samples to assess their immune status.
**Results:** The most common disorders were fungal infections (18%), followed by oral lesions (15.5%), and Papulosquamous disorder (14.8%). Out of 150 patients, 53 patients had 165 dermatological manifestations with a CD4 count below 200 cells/$mm^3$, 85 patients had 105 dermatological manifestations with a CD4 count between 200-500 cells/$mm^3$, and 12 patients had 14 dermatological manifestations with a CD4 count of more than 500 cells/$mm^3$.
**Conclusion:** Both CD4 count and mucocutaneous manifestations can be used as markers of immunosuppression in HIV/AIDS patients. In resource-poor countries where CD4 count and other expensive markers are not affordable, mucocutaneous manifestations alone can be used as a marker of immunosuppression.

**Keywords:** HIV; Mucocutaneous manifestations; CD4 count; Immunosuppression; Resource-poor countries.

## 1. Introduction

Human immunodeficiency virus (HIV) weakens the immune system, leading to the chronic illness known as acquired immunodeficiency syndrome (AIDS) [1]. Since its discovery in 1981, approximately 2.7 million people worldwide contract HIV every year, and 2 million die from AIDS [2]. The number of people living with HIV/AIDS in India is around 2.40 million according to the Government of India [3].

The most common manifestation of HIV infection is mucocutaneous lesions, which serve as the first pointer towards the existence of HIV and valuable indicators of the immune status in patients [4–7]. These lesions can be either infectious or non-infectious, and their frequency of occurrence and contributing factors vary geographically [8]. Although such lesions can affect healthy individuals, they are usually more severe, atypical, widespread, and recalcitrant in HIV-infected patients [9].

In developing countries, the CD4 count, viral load, etc., are utilized to evaluate HIV disease. However, the absence of these facilities and their high cost makes clinical markers necessary for evaluation. The mucocutaneous manifestations can be used as a reliable indicator of HIV disease. Therefore, this study was undertaken to determine the spectrum of skin and mucocutaneous lesions in HIV-positive patients.

The current study was conducted at Cuttack's tertiary care Medical College and Hospital. Patients were enrolled from two centers, Dermatology outdoor and Anti Retro Viral Therapy Centre, within the hospital. The mucocutaneous manifestations were classified, and CD4 cell counts were determined through collected samples to assess their immunity status. The findings of this study could provide valuable information to help diagnose HIV-infected patients early and to help understand the immune status of these patients. This information could also help develop better strategies for the management of HIV/AIDS, especially in resource-limited settings.

## 2. Methodology

The present study was conducted at a tertiary care Medical College and Hospital in Cuttack. Patients were enrolled from two centers within the hospital, including the Dermatology outdoor and the Anti Retro Viral Therapy Centre, between October 2010 and September 2012. Informed consent was obtained from all participants prior to enrollment, and an experienced dermatologist performed a thorough examination of each patient. Bacteriological and fungal tests were carried out, and skin biopsies were performed as required.

The mucocutaneous manifestations observed in the patients were classified according to the following categories: bacterial, fungal, viral, and parasitic infections, pruritic popular eruptions, papulosquamous disorders, oral lesions, drug reactions, hair disorders, and nail disorders. The recorded data was then entered into a performa. CD4 cell counts were determined through collected samples to assess the immunity status of the patients.

The frequency of mucocutaneous manifestations in the enrolled patients was estimated, and the data was analyzed using the Chi-square test. The significance level was set at 95%. The statistical analysis aimed to determine the spectrum of skin and mucocutaneous lesions in HIV-positive patients and establish their relationship with the patients' immune status. The findings of this study can contribute to the development of clinical markers for HIV disease evaluation in resource-poor settings where expensive markers such as CD4 count and viral load tests are not affordable.

In summary, the study's methodology involved enrolling patients from two centers within the hospital and collecting data on the mucocutaneous manifestations of HIV-positive patients. The collected data was classified and analyzed to estimate the frequency of these manifestations and establish their relationship with the patients' immune status. The results of this study have significant implications for HIV disease evaluation in resource-poor settings.

## 3. Results

The study enrolled a total of 150 HIV-seropositive patients with mucocutaneous manifestations of the disease, of which 64% were male. A total of 284 mucocutaneous manifestations were recorded, with an average of 1.9 conditions per patient. The distribution of cases based on age and gender is shown in Figure 1.

Table 1 presents the mucocutaneous manifestations observed in HIV-infected patients and their association with CD4 lymphocyte counts. Bacterial infections were found in 30 patients, accounting for 10.5% of the total mucocutaneous disorders. Folliculitis was the most common bacterial infection, observed in 19 patients (64%). Fungal infections were seen in 51 patients, constituting 17.9% of the total mucocutaneous disorders. Oral candidiasis was the most frequently observed fungal infection, with 16 patients (32%) affected, the majority of whom had a CD4 count <200 cells/$mm^3$. The most prevalent disorders were fungal infections (18%), followed by oral lesions (15.5%) and papulosquamous disorders (14.8%). Pruritic popular eruptions were observed in 33 patients, accounting for 11.61% of the total mucocutaneous manifestations, of which 20 patients (60.6%) had <200 CD4 cells/$mm^3$.

Table 2 presents the number of dermatological manifestations observed in relation to CD4 count. Of the total patients, 53 (35.33%) had a CD4 count <200 cells/$mm^3$.

Out of 284 mucocutaneous manifestations, 165 (58.09%) were observed in patients with a CD4 count <200 cells/$mm^3$, 105 (36.97%) were observed in patients with a CD4 count in the range of 200-500 cells/$mm^3$, and 14

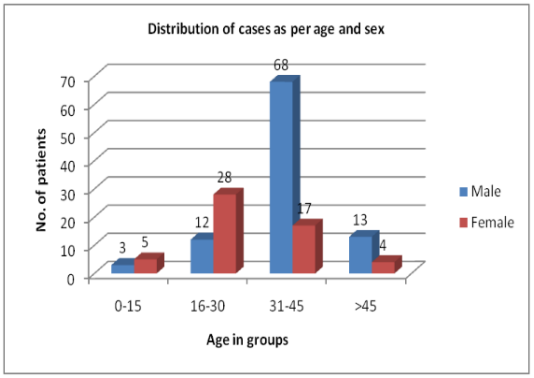


**Figure 1.** Distribution of cases as per age and gender

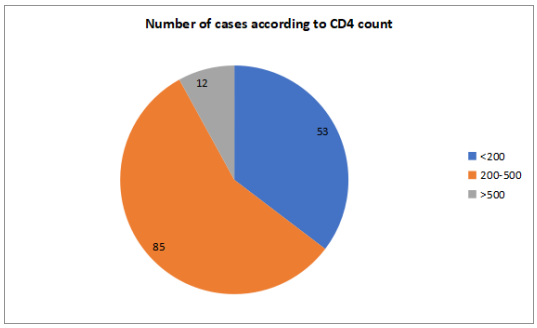


**Figure 2.** Number of cases according to CD4 count

(7.6%) were observed in patients with a CD4 count >500 cells/$mm^3$. Number of cases according to CD4 count are shown in Figure 2.

## 4. Discussion

The present study has revealed a correlation between the degree of immune suppression (measured by CD4 count) and the incidence of specific skin disorders in patients with HIV/AIDS. The study has also established the clinical mucocutaneous indicators of the underlying immune status. A total of 284 dermatological manifestations were recorded, with an average of 1.9 conditions per patient. Folliculitis was the most common manifestation (6.6%), which is comparable to the study by Srikant KP *et al.*, (2010) with 8% of folliculitis lesions [10]. Dermatophytoses were seen in 24 patients (8.4%) of total dermatological manifestations, which is comparable to studies by Shobhana *et al.*, (2004) and Attili *et al.*, (2008) with 13% and 11.7%, respectively [11,12]. Among viral infections, herpes simplex virus causing herpes genitalis and herpes labialis were frequent. Herpes genitalis was seen in 7 patients (2.4%), and Jing *et al.*, 1999 reported 2.9% in a study done in 1998, which matches the present study [13].

Herpes Zoster was observed in 6 patients (2.1%), which is lower than the study of Shobhana *et al.*, (2004) (6%), Attili *et al.*, (2008) (6.5%), and Srikant KP *et al.*, (2010) (12%), which may be due to underreporting of cases [10–12]. Scabies was found in 17 patients (5.9%) of total parasitic infestations, consistent with the study of Attili *et al.*, 2008 (5.4%) [12]. The mean CD4 count was 197.94 cells/$mm^3$, which is lower than the study of Attili *et al.*, (2008) with 290.8 cells/$mm^3$ [12]. The incidence of scabies varies from 3-6% in studies by Nnoruka *et al.*, (2007), Goh *et al.*, (2007), Smith KJ *et al.*, (1996) [1,14,15]. Seborrheic dermatitis constitutes 5.28% of total mucocutaneous manifestations, which is in the similar range as mentioned in Shobhana *et al.*, (2004) reported 4%, and 7% by Attili *et al.*, (2008) [11,12]. Xerosis was observed in 7.04% of cases in the study, compared to a study by Srikant KP *et al.*, (2010) which showed 10% [10].

In our study, not a single case of Kaposi's sarcoma was noted. As it is a more common manifestation among HIV-seropositive male homosexuals, and male homosexuality is less common in our country compared to the Western world, it is less commonly reported in our country. Pruritic papular eruptions were seen in 33 patients (11.61%). Nnoruka *et al.* (2007), Jing *et al.* (1999), Goh BK *et al.* (2007), Singh *et al.* (2009) reported 4%,

**Table 1.** Mucocutaneous manifestations in HIV-infected patients and their relationship with CD4 lymphocyte counts

| **Mucocutaneous Manifestation** | | **CD4 Count (cells/mm3)** | | | **Total** | **Percentage** |
|---|---|---|---|---|---|---|
| | | **<200** | **200-500** | **>500** | | |
| Bacterial Infection | Folliculitis | 12 | 7 | 0 | 19 | 6.69 |
| | Abscess | 1 | 1 | 0 | 2 | 0.7 |
| | Impetigo | 1 | 2 | 0 | 3 | 1.05 |
| | Cellulitis | 1 | 0 | 0 | 1 | 0.35 |
| | Ecthyma | 1 | 1 | 0 | 2 | 0.7 |
| | Hansens | 1 | 0 | 0 | 1 | 0.35 |
| | Cutaneous TB | 1 | 0 | 0 | 1 | 0.35 |
| | Syphillis | 1 | 0 | 0 | 1 | 0.35 |
| Fungal Infection | T. Cruris | 7 | 2 | 2 | 11 | 3.87 |
| | T. Corporis | 6 | 2 | 0 | 8 | 2.81 |
| | T. Manuum | 1 | 0 | 0 | 1 | 0.35 |
| | T. Pedis | 2 | 0 | 0 | 2 | 0.7 |
| | Intertrigo | 2 | 1 | 1 | 4 | 1.4 |
| | Oral Candidiasis | 11 | 4 | 1 | 16 | 5.63 |
| | Vulvovaginal candidiasis | 4 | 2 | 0 | 6 | 2.11 |
| | Candidial balanoposthitis | 2 | 1 | 0 | 3 | 1.05 |
| Viral infections | H. Zoster | 4 | 2 | 0 | 6 | 2.11 |
| | H. Genitalis | 4 | 2 | 1 | 7 | 2.46 |
| | H. Labialis | 2 | 3 | 0 | 5 | 1.76 |
| | M. Contagiosum | 1 | 2 | 0 | 3 | 1.05 |
| | Genital Wart | 0 | 2 | 0 | 2 | 0.7 |
| Parasitic infections | Scabies | 11 | 4 | 2 | 17 | 5.98 |
| | Demodicidosis | 1 | 0 | 0 | 1 | 0.35 |
| | Pediculosis | 0 | 1 | 0 | 1 | 0.35 |
| Pruritic Papular eruptions | Pruritic Papular eruptions | 20 | 12 | 1 | 33 | 11.61 |
| Papulosquamous disorder | Seborrheic dermatitis | 1 | 11 | 3 | 15 | 5.28 |
| | Xerosis | 11 | 8 | 1 | 20 | 7.04 |
| | Icthyosis | 1 | 2 | 0 | 3 | 1.05 |
| | Lichen planus | 1 | 3 | 0 | 4 | 1.4 |
| Oral Lesions | Oral candidiasis | 11 | 4 | 1 | 16 | 5.63 |
| | H. Labialis | 2 | 3 | 0 | 5 | 1.76 |
| | Apthous ulcer | 9 | 2 | 0 | 11 | 3.87 |
| | Lichen planus | 1 | 1 | 0 | 2 | 0.7 |
| | Anagular stomatitis | 1 | 1 | 0 | 2 | 0.7 |
| | Pigmentation | 7 | 0 | 1 | 8 | 2.81 |
| Drug reaction | MPDR | 7 | 5 | 0 | 12 | 4.22 |
| | SJS | 1 | 1 | 0 | 2 | 0.7 |
| | EM | 1 | 1 | 0 | 2 | 0.7 |
| | FDE | 0 | 0 | 1 | 1 | 0.35 |
| Hair changes | Diffuse alopecia | 6 | 3 | 0 | 9 | 3.16 |
| | Spontaneous straightening of hair | 1 | 2 | 0 | 3 | 1.05 |
| Nail changes | Onychomycosis | 10 | 4 | 0 | 14 | 4.62 |
| | Dystrophy | 7 | 2 | 0 | 9 | 3.16 |
| | Paronychia | 0 | 1 | 1 | 2 | 0.7 |
| | Koilonychia | 0 | 2 | 0 | 2 | 0.7 |
| | Bluish discolouration | 4 | 2 | 0 | 6 | 2.11 |
| | Longitudinal melanonychia | 0 | 1 | 0 | 1 | 0.35 |
| | Subungal hyperkeratosis | 0 | 2 | 0 | 2 | 0.7 |

**Table 2.** Number of dermatological manifestations with CD4 count

| CD4 counts (cells/mm3) | No. of mucocutaneous manifestations | Percentage |
|---|---|---|
| <200 | 165 | 58.09 |
| 200-500 | 105 | 36.97 |
| >500 | 14 | 7.6 |

44.6%, 32.2%, and 22.5% of cases of pruritic papular eruptions in their studies [1,13,14,16]. There is no specific test to diagnose PPE of HIV, so its diagnosis is popularly based on the clinical morphology and distribution of lesions. It is mentioned that PPE of HIV may be a reaction pattern to an insect bite (Resneck JS *et al.*, 2004) [17]. Adverse drug reactions were seen in 5.9%, which is less than 13.6% and 12% as reported by Attili *et al.* (2008) and Srikant KP *et al.* (2010), respectively [10,12]. Among these, 4% had a reaction with one of the antiretroviral drugs (most commonly with Nevirapine followed by Efavirenz), and the rest had a reaction with non-ART drugs (Cotrimoxazole, Antitubercular therapy, and Nonsteroidal anti-inflammatory drugs). The most commonly presented drug reaction is the maculopapular type (4.2%) followed by 0.7% Steven Johnson Syndrome, Erythema multiforme each, and 1 case of fixed drug eruption.

Chronic diffuse hair loss in HIV-infected patients has been attributed to chronic HIV-I infection, recurrent secondary infection, nutritional deficiencies, and exposure to multiple drugs (Smith KJ *et al.*, 1996) [18]. Increased pigmentation is commonly seen in HIV-infected persons. In HIV-I diseases, as patients become immunosuppressed, they become immune-activated and immune-dysregulated, which is supported by the elevation of cytokines such as IL-1, IL-6, and TNF-a. IL-I also upregulates a-MSH receptor expression by melanocytes as well as melanin production in the presence of MSH. a-MSH is a potent stimulant for melanocytic activation and pigmentation (Smith KJ *et al.*, 1993) [15].

## 5. Conclusion

Our study highlights the high prevalence of mucocutaneous manifestations in HIV-positive patients and emphasizes their potential use as useful clinical indicators for predicting immune status. Common disorders such as fungal infections, oral lesions, and papulosquamous disorders should prompt regular skin examinations for HIV-infected patients. While our study was limited by its small sample size, further multicenter studies with larger sample sizes are needed to clarify conflicting results. Both CD4 count and mucocutaneous manifestations can serve as markers of immunosuppression in HIV/AIDS patients. In resource-poor countries where CD4 count and other expensive markers are not affordable, mucocutaneous manifestations alone may be used as a marker of immunosuppression.

**Author Contributions:** All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

**Conflicts of Interest:** "Authors declare that they do not have any conflict of interests."

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