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Research

## STUDY TO KNOW THE ASSOCIATION BETWEEN SKIN MANIFESTATIONS AND CD4 COUNTS IN HIV DIAGNOSED PATIENTS

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**Abstract:**

**Objective:** In HIV positive patient's skin manifestation are usual clinical features. We arranged this study to obtain the objective of documenting these skin manifestations and association with CD4 cell counts in HIV positive patients.

**Study design:** A Descriptive study.

**Place and duration:** In the Department of Dermatology Mayo Hospital Lahore for one year duration from February 2018 to February 2019.

**Methodology:** The mode of this study was descriptive in nature and the patients who were included in this study were examined for skin disorders; carefully undertaken by a dermatologist. The CD4 count of the patients were acquired through patient records. T tests were used for data analysis via independent samples.

**Results:** 66 (94.3%) patients who were a part of this study had skin infections, the least count was one. The most common cause of skin disease was found to be fungal infection. Other most common occurrences were of mucocutaneous problems including pallor, gingivitis, photosensitive skin, itching candidiasis, folliculitis, tinea versicolor and seborrheic dermatitis. The most common of these diseases mentioned above was gingivitis. ( $P < 0.05$ ) Cell count of CD4 was found to be lower in subjects exhibiting viral and bacterial skin disease.

**Conclusion:** The study and its results signpost that HIV patients exhibit skin problems as a norm. Lowest CD4 count is found in patients who are going through advanced phases of skin disorder. It is recommended after carefully keeping in mind the results of this study that HIV positive patients should go thorough skin examination to avoid dermatologic issues. This will help increase the quality of life in HIV positive patients.

**Key words:** CD4 count, skin manifestation, bacterial skin disease.

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**INTRODUCTION:**

The number of people currently affected by HIV in the world is between 39–46 million. HIV infection stands as one of the leading health issue around the globe [1-3]. There have been studies undertaken on different domains of internal medicine the objective of which is to find an association between systemic changes and CD4 cell count. Skin disease itself is one health issue common among patients who are HIV positive exhibiting a variety of manifestations which are dermatologic in nature [4-5]. Among patients who are HIV positive, significant morbidity and frequent signs of immunosuppression are caused by skin diseases. A valuable clinical indicator of HIV infection is skin manifestation, because there has been found a correlation between skin condition and CD4 cell counts [6]. Regular range of CD4 count between adults is 500 to 1500 cells/mm<sup>3</sup> of blood.

Generally, CD4 count percentage drops in progression of HIV disease [7]. Moderately higher risk of disease progression among patients of HIV infection is associated with low CD4 cells [8]. Indication of progression of HIV disease may be correlated with skin conditions where it can be seen as disfiguring and in some cases to an extent where it is life threatening [9].

The general health status often is influenced by mucocutaneous manifestations and this may indicate a poor diagnosis of the disease and can be considered as a prognostic factor in poor monitoring of immune eminence of the patients [10]. There have been many a few studies which show the correlation between skin disorders and HIV infection, this can serve as an advanced HIV infection indicator which also

includes lower CD4 counts and immunosuppression [11].

The objective of this study was to find out the pervasiveness and relationship of dermatologic issues with lower CD4 counts in patients with HIV infection.

**MATERIALS AND METHODS:**

This Descriptive study was held in the Department of Dermatology Mayo Hospital Lahore for one year duration from February 2018 to February 2019. The study includes 70 patients with the status of being HIV positive. To identify skin disorders the patients underwent a physical examination which was done by a dermatologist. Biopsy of the skin went through histopathological examination and lab tests were performed to confirm clinical diagnosis. Most recent CD4 cell count was obtained of all the patients from their medical records included in the study. Flow cytometry which is the gold standard to measure T-lymphocytes CD4 measurements.

SPSS v.18.0 was used to process data and to determine the associations of variables and final analysis of independent samples. T-test, P values lesser than 0.05 was taken into consideration as significant. Patients only those who understood the objectives were included in the study.

**RESULTS:**

There were 70 patients included in this study and sixty eight of them were male and two were female. Skin lesions were found in all patients out of which 94.3 percent (66) had at least one lesion and 62.8 percent (44) had more than four and at least four skin lesions as shown in table-I.

**Table-I: Frequency of skin lesions in HIV positive patients**

<i>Skin lesion</i>	<i>Patient with skin lesions</i>	
	<i>Frequency</i>	<i>%</i>
No lesion	4	5.7
1 lesion	3	4.3
2 lesions	6	8.6
3 lesions	13	18.6
4 lesions	17	24.3
5 lesions	10	14.3
6 lesions	4	5.7
≥7 lesions	13	18.5
<b>Total</b>	<b>70</b>	<b>100</b>

The most common aetiology of skin infection was fungal infection. There were 8 more common types of mucocutaneous issues found as shown in table- II

which were pallor, gingivitis, photosensitive skin, itching candidiasis, folliculitis, tinea versicolor and seborrheic dermatitis.

**Table-II: Frequency of skin diseases in the patients**

<i>Skin diseases</i>	<i>N (%)</i>
<b><i>Viral</i></b>	
Herpes simplex	9 (12.9)
Herpes zoster	7 (10)
Wart	5 (7.1)
Cytomegalo virus infection	1 (1.4)
<b><i>Fungal</i></b>	
Candida albicans	22 (31.4)
Pityriasis versicolor	16 (22.9)
Tricophyton rubrum	1 (1.4)
<b><i>Bacterial</i></b>	
Folliculitis	21 (30)
Furuncle	7 (10)
Skin TB	3 (4.3)
Abscess	1 (1.4)
<b><i>Neoplastic</i></b>	
Kaposi's Sarcoma	1 (1.4)
<b><i>Parasitic</i></b>	
Amebiasis	1 (1.4)
<b><i>Eczema</i></b>	
Seborrheic dermatitis	23 (32.9)
<b><i>Others</i></b>	
Gingivitis	58 (82.9)
Pruritus	30 (42.9)
Photosensitivity	25 (35.7)
Xeroderma	13 (18.6)
Pallor	36 (51.4)
Telogen effluvium	8 (11.4)
Alopecia areata	4 (5.7)
Pityrosporum folliculitis	4 (5.7)
Long eyelashes	3 (4.3)
Aphthosis	2 (2.9)
Prurigo-like lesions	1 (1.4)
Bacillary angiomatosis	1 (1.4)
Eosinophilic pustulosis	1 (1.4)
Maculo papular lesions	1 (1.4)

34.07 ( $\pm 7.6$ ) was the mean age of subjects in years and 4.3 ( $\pm 2.4$ ) was the mean number of skin lesions. CD4 mean cell count per mm<sup>3</sup> of blood was found to be 640.6 ( $\pm 294.8$ ). No significant relationship between CD4 count and dermatological diseases was

found among skin lesions. Individuals included in the study who had bacterial and viral skin infections were found to have significantly lower CD4 cell count mean ( $P = 0.02$ ) as shown in Table-III.

Table-III: Relationship between etiology of skin disorders and CD4 counts (cell/mm<sup>3</sup>)

Etiology	Mean CD4 counts ( $\pm$ SD)		P-value
	With disease	Without disease	
Viral	524( $\pm$ 295.5)	690.6( $\pm$ 283)	0.02
Fungal	578.2( $\pm$ 289.6)	690.2( $\pm$ 293.1)	0.1
Bacterial	548.8( $\pm$ 256.2)	698.3( $\pm$ 305.6)	0.03
Neoplastic	1102	634.3( $\pm$ 291.6)	0.1
Parasitic	321	645.3( $\pm$ 294.4)	0.2
Eczema	644( $\pm$ 323.9)	639( $\pm$ 283.2)	0.9

### DISCUSSION:

Among the patients included in this study 94.3% had at least one skin lesion. Studies from different regions suggest that pattern of prevalence of skin diseases vary among different regions <sup>12</sup>. Occurrences of dermatologic issue in Cameron, Zambia, Thailand and Tanzania were 68.8%, 98.3%, 95%, 41.7% respectively [13].

The status of healthcare, environmental and climate conditions explain the different results of different regions. The frequent causes of cutaneous issues found in this study were eczema, bacterial and fungal infections. Past studies suggest neoplasia with viral, bacterial and fungal infections as the common occurrence of skin diseases [14]. Eichmann et al's<sup>22</sup> study shows that eczema was common cause like in our study.

A recent study conducted in the USA suggests that the most common disorders were (23%) oral hairy leukoplakia, (19%) folliculitis and (34%) dermatophytosis. Many conditions such as Oral candidiasis (34.3%), seborrheic dermatitis (21.0%), oral hairy leukoplakia (14.9%), pruritic peplular-eruption (32.7%), herpeszoster (16.1%), cutaneous ringworm (7.7%), folliculitis (5.6%), psoriasis (6.5%), onychomycosis (9.3%) and herpes simplex (10.9%) were reported which had 5% higher rates in sivayathorn's study. Oral candidiasis (54.17%) and xerosis (73.33%) were found to be the most common disorders with other diseases including oral hairy leukoplakia (12.50%), seborrheic dermatitis (46.67%), alopecia (6.67%), folliculitis (11.67%), herpes zoster (9.17%) and pruritic papular eruption (36.67%), in Wiwanitkit's study [15].

Different outcomes of the study suggest that the different variations in sample size may have impacted the observed results, also the fact that the studies were organised to find different outcomes may have affected the results and became a cause in varied results than our study. There are other studies in which the mean counts of CD4 varied between 128

and 353 cell per mm<sup>3</sup>. A higher mean CD4 count may be the result of the delay in occurrence of HIV infection in this region. In a few studies mean CD4 cell counts were higher than that our study in viral disorders. The results of this study do not suggest any relationship between skin diseases due to higher CD4 counts in our subjects. The results however suggest that a higher CD4 in HIV infected patients does not hinder the development of skin disorders.

### CONCLUSION:

We conclude our study with the assumption that progression of the disease and the immune status of the patient is associated with the frequency and number of skin manifestations in HIV infected patients. Common occurrences of skin disorders are found in HIV infected patients in our group of chosen subjects of the study and we found that advanced stages of the skin issues have reasonably low CD4 counts in their blood. Patients who are going through advanced stages of HIV infection are found to have more skin diseases than the one's in initial stages. Diagnosis and management of the disease in early stage is likely to improve the quality of life of HIV infected patients.

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