Original Article

THE RELATIONSHIP BETWEEN SKIN MANIFESTATIONS AND CD4 COUNTS AMONG HIV POSITIVE PATIENTS

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ABSTRACT

Objective: Skin manifestations are common clinical features among HIV positive patients. The aim of this study was to document skin manifestations and their relationships with CD4 cell counts among HIV positive patients in Sanandaj.

Methodology: This was a descriptive study. The patients were examined for skin disorders by a dermatologist and CD4 counts were obtained from the patient's medical records. Independent samples T test were used for data analysis.

Results: In this study 66 (94.3%) patients had at least one skin problem. Fungal infections were the most common cause. The eight most common types of mucocutaneous problems were gingivitis, pallor, itching, photosensitivity, seborrheic dermatitis, candidiasis, folliculitis and tinea versicolor. The most common manifestation was gingivitis. Mean CD4 cell counts were lower in individuals with viral and bacterial skin diseases (P <0.05).

Conclusion: The results of this study indicated that skin problems were common among HIV positive patients. Patients with advanced stages of skin disorders had relatively lower CD4 counts. Therefore examination of skin is recommended for all HIV positive patients for early detection of skin disorders, as early diagnosis and management of dermatologic problems will improve the quality of life in HIV positive patients.

KEY WORDS: HIV, Skin Disease, CD4.

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INTRODUCTION

About 39–46 million people in the world are currently living with HIV/AIDS[1,2] and HIV infection constitutes a main health problem world-wide.[3-6] Studies on different domains of internal medicine have been trying to look for correlation between CD4 cell counts & systemic changes.[2] Skin disease is one health problem among HIV positive patients presenting with a variety of dermatologic manifestations.[7,8]

Among HIV-infected individuals, skin diseases cause significant morbidity and may be frequently initial signs of immunosuppression.[9] Skin manifestations have been shown to be valuable clinical indicator of HIV infection and associations have been established between some skin conditions and CD4 cell counts in HIV-infected individuals.[8,10] The normal absolute CD4 count in adolescents and adults ranges from 500 to 1500 cells per mm^3 of blood.

In general, the CD4 (%CD4+ or absolute count) progressively decreases as HIV disease advances.[11]

Low CD4 cell count nadir is associated with a moderately higher risk for disease progression among HIV positive patients.[12] Skin conditions may indicate progression of HIV disease and they can be disabling, disfiguring, or even life-threatening.[9]

The mucocutaneous manifestations often influence 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.[3,6] Several studies have shown that association of skin disorders with HIV infection can serve as an indicator for advanced HIV infection, immunosuppression and decreased CD4 cell counts.[10-19]

The aim of this study was to determine the prevalence of dermatologic problems in HIV positive patients and its relationship to CD4 cell counts in Sanandaj city.

METHODOLOGY

This is a cross-sectional descriptive study and included 70 HIV positive patients in the HIV voluntary center of Sanandaj city. Physical examination was performed to identify all possible skin disorders. In cases with doubtful clinical diagnosis of skin disorder, skin biopsies were taken for histopathological examination and also relevant lab. tests were performed. The most recent CD4 counts (cell/mm^3) of the patients were obtained from patients' medical records after physical examination. The CD4 counts were assessed by flow cytometry (gold standard for CD4 T lymphocytes measurements).[11]

The results were processed with SPSS Win 13 and associations between variables were analyzed with Independent samples T-test. P-values less than 0.05 were considered significant. Only those patients who fully understood the objectives of the study and agreed to participate were eventually recruited into the study.

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

Skin lesion	*Patient with skin lesions*	
	Frequency	*%*
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
Total	70	100

RESULTS

Among 70 patients (2 females and 68 males), 66 (94.3%) had at least one and 44 (62.8%) had four or more skin lesions (Table-I). Fungal infection constituted the most common infectious etiology of skin problems. The eight most common types of mucocutaneous problems were gingivitis, pallor, itching, photosensitivity, seborrheic dermatitis, candidiasis, folliculitis and tinea versicolor (Table-II).

The mean age of the patients was 34.07 (±7.6) years and mean number of skin lesions was 4.3 (±2.4). Mean CD4 cell count was 640.6 (±294.8) cell/mm^3. There was no significant correlation between CD4 counts and both etiologies of dermatological diseases and total skin lesions. Mean CD4 cell count was lower significantly in individuals with viral and bacterial skin diseases (P =0.02). (Table-III).

DISCUSSION

In this study in 94.3% of the patients, at least one skin lesion was detected. There is evidence in literature pertaining to the fact that prevalence and pattern of skin diseases vary from region to region,[13,20,21] for instance the prevalence rates of dermatologic problems in Tanzania,[16] Cameron,[2] Thailand[21] and Zambia[18] were 41.7%, 68.8%, 95%, 98.3% respectively. This could be explained by differences in status of self health care, climatic and environmental conditions.

In our study fungal and bacterial infections and eczema were the most frequent causes of cutaneous disorders. But in other studies, fungal, viral and bacterial infections together with

Table-II: Frequency of skin diseases in the patients

Skin diseases	*N (%)*
Viral	
Herpes simplex	9 (12.9)
Herpes zoster	7 (10)
Wart	5 (7.1)
Cytomegalo virus infection	1 (1.4)
Fungeal	
Candida albicans	22 (31.4)
Pityriasis versicolor	16 (22.9)
Tricophyton rubrum	1 (1.4)
Bacterial	
Folliculitis	21 (30)
Furuncle	7 (10)
Skin TB	3 (4.3)
Abscess	1 (1.4)
Neoplastic	
Kaposi's Sarcoma	1 (1.4)
Parasitic	
Amebiasis	1 (1.4)
Eczema	
Seborrheic dermatitis	23 (32.9)
Others	
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 eylashes	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)

neoplasia were common causes of skin diseases.[17,19] Similar to Eichmann's study, eczema was common in our patients.[22]

In a study in the USA the most common conditions were dermatophytosis (34%), oral hairy leukoplakia (23%) and folliculitis (19%).[18] Sivayathorn reported several conditions with prevalence rates higher than 5% including oral candidiasis (34.3%), pruritic papular eruption (32.7%), seborrhoeic dermatitis (21.0%), herpes zoster (16.1%), oral hairy leucoplakia (14.9%), herpes simplex (10.9%), onychomycosis (9.3%), cutaneous ringworm (7.7%), psoriasis (6.5%) and folliculitis (5.6%).[24]

Wiwanitkit concluded that xerosis (73.33%) and oral candidiasis (54.17%) were the most common skin disorders, followed by seborrheic dermatitis (46.67%), pruritic papular eruption (36.67%), oral hairy leucoplakia (12.50%), folliculitis (11.67%), herpes zoster (9.17%) and alopecia (6.67%).[7] Furthermore, variation in sample size in the different studies may influence the different outcome observed. In other studies the mean CD4 counts varied from 128 to 353 cell/mm^3 ,[2,8,24,25] but our study revealed a higher mean CD4 count which may be due to a delay in occurrence of HIV infection in our country.

In our study mean CD4 cell count was low in individuals with viral and bacterial skin infections but in some studies mean CD4 cell counts in patients with viral disorders were higher than that of our study.[2,21] In general, our study showed no strong correlation between CD4 cell counts and skin disorders which could be due to the higher values of CD4 count in our patients. However we concluded that skin disorders can be seen with higher CD4 cell counts in HIV patients. Dermatological diseases are highly prevalent among HIV-infected patients and the frequency and number

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

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

N: Number

of these manifestations are well correlated to the patient's immune status and disease progression.[24]

We conclude that skin disorders are common among HIV positive patients in Sanandaj and patients with advanced stages of skin problems have relatively low CD4 counts. The results of this study indicated that all HIV positive patients should be examined for skin disorders because early diagnosis and management of such problems will improve the quality of life in these patients. Patients with advanced HIV infection were found to have significantly more skin disorders than those with early stage HIV.[7]

REFERENCES

1. UNAIDS Report of the global HIV/AIDS Epidemic. Joint United Nations Programme on HIV/AIDS, Geneva 2003.
2. Mbuagbaw J, Eyong I, Alemnji G, Mpoudi N, Same-Ekobo A. Patterns of skin manifestations and their relationships with CD4 counts among HIV/AIDS patients in Cameroon. Int J Dermatol 2006;45:280-4.
3. Bravo IM, Correnti M, Escalona L, Perrone M, Brito A, Tovar V, et al. Prevalence of oral lesions in HIV patients related to CD4 cell count and viral load in a Venezuelan population. Med Oral Patol Oral Cir Bucal 2006;11:E1-5.
4. Ranganathan K, Umadevi M, Saraswathi TR, Kumarasamy N, Solomon S, Johnson N. Oral lesions and conditions associated with Human Immu-nodeficiency Virus infection in 1000 South Indian patients. Ann Acad Med Singapore 2004;33(4 Suppl):37-42.
5. Reichart PA, Khongkhunthian P, Bendick C. Oral Manifestations in HIV infected individuals from Thailand and Cambodia. Med Microbiol Immunol 2003;192(3):157-60.
6. Moniaci D, Greco D, Flecchia G, Raitieri R, Sinicco A. Epidemiology, clinical features and prognostic value of HIV-1 related oral lesions. J Oral Pathol Med 1990;19(10):477-81.
7. Wiwanitkit V. Prevalence of dermatological disorders in Thai HIV-infected patients correlated with different CD4 lymphocyte count statuses: A note on 120 cases. Int J Dermatol 2004;43(4):265-8.
8. Kumarasamy N, Solomon S, Madhivanan P, Ravikumar B, Thyagarajan SP, Yesudian P. Dermatologic manifestations among human immunodeficiency virus patients in south India. Int J Dermatol 2000;39(3):192-5.
9. Coopman SA, Johnson RA, Platt R, Stern R. Cutaneous disease and drug reactions in HIV Infection. N Engl J Med 1993;328(23):1670-4.
10. Bakari M, Pallangyo K, Kitinya J, Mbena E, Urassa W. The importance of clinical features in differentiating HIV-related from non HIV-related Kaposi's sarcoma: Experience from Dar es salaam, Tanzania. Trop Doct 1996;26(3):104-7.
11. World Health Organization. WHO case definitions of HIV for surveillance and revised clinical staging and immunological classification of HIV-related disease in adults and children. World Health Organization, Geneva; 2007:14.
12. Miller V, Mocroft A, Reiss P, Katlama C, Papadopoulos AI, Katzenstein T, et al. Relations among CD4 lymphocyte count nadir, antiretroviral therapy, and HIV-1 disease progression: results from the EuroSIDA study. Ann Intern Med 1999;130(7):570-7.
13. Yazdanpanah Y, Chêne G, Losina E, Goldie SJ, Merchadou LD, Alfandari S, et al. Incidence of primary opportunistic infections in two human immunodeficiency virus-infected French clinical cohorts. Int J Epidemiol 2001; 30(4):864-71.
14. Margiotta V, Campisi G, Mancuso S, Accurso V, Abbadessa V. HIV infection: oral lesions, CD4+ cell count and viral load in an Italian study population. J Oral Pathol Med 1999;28(4):173-7.
15. Munoz-Perez MA, Rodriguez-Pichardo A, Camacho F, Colmenero MA. Dermatological findings correlated with CD4 lymphocyte counts in a prospective 3 year study of 1161 patients with human immunodeficiency virus disease predominantly acquired through intravenous drug abuse. Br J Dermatol 1998;139(1):33-9.
16. Muhammad B, Eligius L, Mugusi F, Aris E, Chale S, Magao P, et al. The prevalence and pattern of skin diseases in relation to CD4 counts among HIV-infected police officers in Dar es Salaam. Trop Doct 2003;33(1):44-8.
17. Samet JH, Muz P, Cabral P, Jhamb K, Suwanchinda A, Freedberg KA. Dermatologic manifestations in HIV-infected patients: a primary care perspective. Mayo Clin Proc 1999 Jul;74(7):658-60.
18. Hira SK, Wadhawan D, Kamanga J, Kavindele D, Macuacua R, Patil PS, et al. Cutaneous manifestations of human immunodeficiency virus in Lusaka, Zambia. J Am Acad Dermatol 1988 Sep;19(3):451-7.
19. Spira R, Mignard M, Doutre MS, Morlat P, Dabis F. Prevalence of cutaneous disorders in a population of HIV-infected patients. Southwestern France, 1996. Groupe d'Epidemiologie Clinique du SIDA en Aquitaine. Arch Dermatol 1998 Oct;134(10):1290-2.
20. Stein DS, Korvick JA, Vermund SH. CD4+ lymphocyte cell enumeration for prediction of clinical course of human immunodeficiency virus disease: A review. J Infect Dis 1992 Feb;165(2):352-63.
21. Pitche P, Tchangaï-Walla K, Napo-Koura G, Mijiyawa M, Agbere A, Tatagan A. Prevalence of Skin Manifestations in AIDS Patients in the Lome-Tkom University Hospital (Togo). Sante 1995;5(6):349-52.
22. Eichmann A. Skin manifestations in patients with HIV infection. Z Hautkr 1990;65(7):640-4.
23. Sivayathorn A, Srihra B, Leesanguankul W. Prevalence of skin disease in patients infected with human immunodeficiency virus in Bangkok, Thailand. Ann Acad Med Singapore 1995;24(4):528-33.
24. Michelim L, Atti JL, Panarotto D, Lovatto L, Boniatti MM. Dermatological disease among HIV-infected patients with CD4-lymphocyte count. Rev Saude Publica 2004;38(6):758-63.
25. Reynaud-Mendel B, Janier M, Gerbaka J, Hakim C, Rabian C, Chastang C, et al. Dermatologic findings in HIV-1-infected patients: A prospective study with emphasis on CD4+ cell count. Dermatology 1996;192(4):325-8.