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# Prevalence and Pattern of Dermatological Lesions in Relationship to CD4 Cell Counts among newly Diagnosed HIV Patients in Nigeria, West Africa

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## ABSTRACT [ENGLISH/ANGLAIS]

HIV/AIDS is associated with protean cutaneous lesions which may be the first pointer towards the existence of the disease. The study sought to describe the hospital prevalence and clinical spectrum of cutaneous lesions of HIV/AIDS and the association with CD4 cell counts. This was a hospital based, cross sectional, descriptive study of 160 newly diagnosed adult HIV/AIDS patients attending the HIV/AIDS clinic of UITH. The prevalence of cutaneous lesions was 72%. The most prevalent was of inflammatory aetiology (67.8%) comprising of Pruritic Papular Eruption [PPE] (35%), followed by lesions of viral origin (17.4%) mainly Herpes Zoster [HZ] (10%). The study therefore reveals that there are myriads of cutaneous lesions associated with HIV/AIDS, occurring in patients with CD4 cell counts less than 200 $\mu$ l. Primary care physician can therefore help in the early diagnosis of HIV/AIDS by having a high index of suspicion.

**Keywords:** Newly diagnosed, HIV/AIDS, cutaneous lesions, CD4 cell counts, Nigeria

## RÉSUMÉ [FRANÇAIS/FRENCH]

Le VIH/SIDA est associée à des lésions cutanées protéiformes qui peuvent comme premier indice indiquer l'existence de la maladie. L'étude visait à décrire la prévalence hospitalière et le spectre clinique des lésions cutanées due au VIH/SIDA et l'association avec le taux de CD4. Il s'agit d'une étude qui s'est basée sur des cas hospitalier, en coupe transversale, décrit par 160 cas d'adultes nouvellement diagnostiqués infectés du VIH et qui fréquentent une clinique pour malades d'UITH. La prévalence des lésions cutanées était de 72%. La plus répandue est l'étiologie inflammatoire (67,8%) comprenant Eruption papuleuse Prurit [EPP] (35%), suivie par des lésions d'origine virale (17,4%) avec principalement le zona [ZV] (10%). L'étude révèle donc qu'il y a des myriades de lésions cutanées liées au VIH/SIDA, chez des patients avec un taux de CD4 de moins de 200. Le médecin responsable des soins primaires peut donc aider dans le diagnostic précoce du VIH / sida en ayant un indice de suspicion élevé.

**Mots-clés:** Nouvellement diagnostiqués, VIH / SIDA, lésions cutanées, taux de CD4, Nigeria

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## INTRODUCTION

In 1981, when the first reports about HIV/AIDS were published in medical literature, cutaneous diseases played an important role in the clinical diagnosis of AIDS. Kaposi's sarcoma in young homosexual men was the first symptom that made HIV/AIDS a visible disease [1]. In

general, skin conditions in HIV infection can occur in unusual settings, can be very severe, can have a bizarre clinical presentation, can run a recurrent course, can be part of systemic opportunistic infections and can have abnormal response to conventional treatment. In tropical countries, especially Sub-Sahara Africa other factors

facilitate the development of cutaneous diseases. These include the hot and humid climate, poor living conditions without pipe-borne water, malnutrition, ignorance and poor hygiene. This is the situation in most parts of Ilorin, Kwara State, Nigeria, where this study took place.

Patients with HIV infection have depleted Langerhan cells, dendritic cells T-lymphocytes and monocytes which are the target of HIV infection because of the presence of CD4 receptors on their surface membranes [2]. A systematic way of classifying skin manifestation in HIV/AIDS diseases is according to its aetiology or pathogenic mechanisms. Cutaneous manifestations related to HIV/AIDS can be classified into three categories namely: cutaneous hypersensitivity reactions, infection/infestations and neoplasia [2]. These cutaneous lesions may be fungal, viral, bacterial or inflammatory in origin [2].

HIV disease progression is monitored by two plasma markers: CD4 cell counts and HIV viral loads. A CD4 count is a reliable prognostic indicator of immune response to therapy [3]. Appropriate recognition, proper identification and systematic classification of cutaneous lesions in HIV and its relation to the degree of immune suppression could be used to predict HIV disease progression.

Dermatologists are unavailable in most hospitals in developing countries, where present, the necessary supportive facilities for effective patient management are lacking. This study becomes relevant due to the paucity of data on cutaneous manifestation of HIV/AIDS in North Central Nigeria, since cutaneous lesions also have local and geographic differences [4].

## MATERIALS AND METHODS

The study was conducted at the lentiviral clinic of the Department of Family Medicine, UITH, Ilorin, Nigeria. It was a descriptive, cross-sectional study carried out from 1<sup>st</sup> January to 30<sup>th</sup> June 2009. The inclusion criteria were newly diagnosed adult ( $\geq 18$  years) HIV/AIDS patients at the lentiviral clinic who consented to participate in the study. Individuals on HAART prior to presentation and those who refused to participate were excluded.

The sample size was estimated using the Fisher's formula [5].

$$n = \frac{Z^2 p(1-p)}{e^2}$$

n=desired sample size

p=best estimate of prevalence of mucocutaneous disease in HIV. The prevalence rate of 90% from a previous study was used [6].

e= Acceptable error, usually set at 0.05

Z= Score of 1.96, which corresponds to 95% confidence level.

Therefore:

$$n = \frac{(1.96)^2 0.9(1-0.9)}{(0.05)^2} = 138.30$$

In order to take care of non-respondents (assuming anticipated response was 90%) then:

$$n = \frac{138.30}{0.9} = 153.664 = 160$$

Thus, an estimated sample size of 160 was used for the study. Systematic random sampling was used in recruiting respondents into the study. On average two new adult HIV patients were referred daily from family medicine outpatient's clinic as obtained from the record department. Weekly average attendances of 14 new adult HIV patients were interviewed to obtain the total sample size of 160 in 6 months.

The sampling interval was therefore  $336/160 = 2:1$ . On every clinic day, each folder was assigned a number code from 01 – 14. The starting point was randomly selected by simple balloting whereby, a paper was picked from folded pieces of paper bearing number 01 – 14. Therefore every 2<sup>nd</sup> folder was chosen for the study until the required sample was obtained for the week. This procedure was repeated every week until the required total sample size was obtained.

Ethical approval was obtained from the Ethical Review Committee of UITH before commencement of the study. Participants were recruited into the study at the lentiviral clinic of the department of family medicine, UITH, Ilorin. An informed consent was obtained after adequate information about the study. An interviewer administered questionnaire was used, with provision for interpreters in local dialect, in those without formal education. Skin scrapping from the edges of suspected fungal lesions was placed in 30% potassium hydroxide mount for examination with subsequent culture in saboraud's agar. Skin biopsy was performed for lesions of doubtful diagnosis and fixed in 10% buffered formalin before evaluation. Data obtained was analyzed using Epidemiological Information (Epi-Info) 2005 software package and chi-square test and p-value  $<0.05$  was used as test of significance.

**RESULTS**

Out of the 160 subjects who participated in this study (table 1), 115 (71.8%) had one skin lesion or the other. Inflammatory lesions were commonest (67.8%); other were viral lesions (17.4%).

**Spectrum of Cutaneous Lesions among HIV/AIDS Patients (N = 115)**

We obtained a spectrum of occurrence of the cutaneous lesions (table 1). The commonest was Pruritic Papular Eruptions 39 (33.9%). Others include seborrheic dermatitis 20 (17.4%) herpes zoster 12 (10.4%) and Kaposi's sarcoma 2 (1.7%).

**Table 1:** This table shows the spectrum of cutaneous lesions in the study participants

Spectrum of Cutaneous Lesions	Frequency	%
<b>Inflammatory</b>		
Pruritic Papular Eruption (PPE)	39	33.9
Seborrheic dermatitis	20	17.4
Xerosis and ichthyosis	6	5.2
Psoriasis	5	4.4
Lichenoid eruption	4	3.5
Drug eruption	4	3.5
<b>Viral</b>		
Herpes zoster	12	10.4
Molluscum contagiosum	4	3.5
Warts/condyloma	4	3.5
<b>Fungal</b>		
Tinea manum/ungium	6	5.2
Tinea incognito	1	0.9
Extensive tinea corporis	1	0.9
<b>Bacteria</b>		
Syphilis	2	1.7
Pyoderma	2	1.7
<b>Parasitic</b>		
Scabies	3	2.6
<b>Neoplastic</b>		
Kaposi's sarcoma	2	1.7
<b>TOTAL</b>	<b>115</b>	<b>100</b>

**Association between CD4 Cell Count and Cutaneous Lesions in HIV/AIDS Patients**

About 32.5% of the study participants had CD4 cell counts of <200µl while 67.5% had CD4 between 200 and 500 cells/µl. None had CD4 counts great than 500µl (table 2).

In addition, respondents with very low CD4 cell counts (< 200 cells/µl) had significant cutaneous disorders, than those with high CD4 cell counts (200-500 cell/µl) (table 3). This association was statistically significant (p<0.04).

**Table 2:** CD4 counts of HIV/AIDS patients with cutaneous lesions (N= 160)

CD4 Cell Counts/NI	n	%
< 200	52	32.5
200-500	108	67.5
> 500	0	0.0
<b>Total</b>	<b>160</b>	<b>100</b>

**Table 3:** Association between CD4 Cell Count and Cutaneous Lesions in HIV/AIDS Patients

CD4 Cell counts	Skin Disease:		Total
	Absent	Present	
< 200	9(17.3)	43(82.7)	52
200-500	36(33.3)	72(66.7)	108
<b>Total</b>	<b>45</b>	<b>115</b>	<b>160</b>

$X^2 = 4.459, df = 1, p = 0.035$

**DISCUSSION**

The prevalence of cutaneous lesions among HIV/AIDS patients in this study was 72%. This was similar to reports of 75% by Essen [7] in Lagos, 75% by Ojoh [8] in Jos, and 66.7% Ahamefule [9] in Lagos all in Nigeria. The result was also comparable to 71.7% by Wang [10], 79% by Coopman [11] and 69% by Munoz-Perez [12]. However, the prevalence in this study was lower than 93.5% by Edith [6], 90% reported by Sivayathorn[13], 91.4% by Uthayakyma [14], 92% by Coldiron et al. [15] 98.3% by Hira [16] and 82.5% by Pitch. [17] Much lower prevalence were reported by Okeahialam (50%) [18] Muhammed [4] (41.7%) and Lartey [19] (14%)

These differences in prevalence of cutaneous disorders may be due to wide variation in prevalence of HIV/AIDS from one country to the other, as well as regional variation in cutaneous disorders.

The commonest cutaneous disorder in this study was Pruritic Papular Eruption (PPE). This was similar to the findings of Olumide [20] in Lagos, Nigeria, Ojoh, [8] in

Jos, Nigeria, Edith[6] at the University of Nigeria and Lartey [19] at the Korle Bu Teaching Hospital, Ghana. The symmetry, plurality and distribution of lesions on exposed body areas may possibly reflect the frequency of arthropod bites or a systemic response to these bites as interleukin-2 levels have been found to be low in PPE. [2] Seborrheic dermatitis was the second commonest lesions in this study. The positive predictive value of this condition for HIV seropositivity was reported as 9.3% [21] Onchomycosis was the most frequent presentation of dermatophytosis in the study. This was similar to the report of Lartey [19] in Ghana. However, scabies was relatively uncommon.

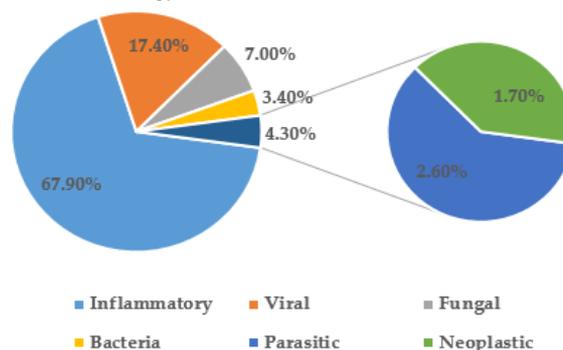
### CONCLUSION

This study showed a high prevalence of dermatological lesions in HIV infected patients, and a significant inverse relationship between CD4 counts and cutaneous lesions, at University of Ilorin Teaching Hospital (UIH). Cutaneous manifestations can therefore be considered as good clinical indicators, to predict and access the underlying immune status in resource-poor countries. Furthermore, HIV infection should be suspected when a

cutaneous lesion tends to be chronic, severe, bizarre and involves more than one dermatome.

Physicians caring for People Living with HIV (PLWH), should be familiar with the diagnosis and management of common cutaneous lesions, because prompt and appropriate management of these conditions will reduce morbidity.

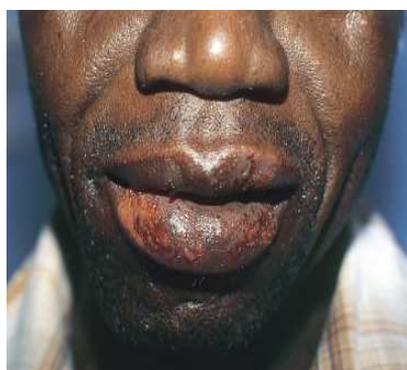
**Figure 1:** This figure shows the prevalence of skin lesions based on aetiology.



Cutaneous lesions of inflammatory aetiology were the most prevalent, constituting 67.8% while skin lesions of viral origin were 17.4%. Malignant cutaneous lesions were relatively rare 1.7%.



**Figure 2:** Tinea unguium in one of the HIV positive patients



**Figure 3**

**Figure 3:** HIV positive 43- year old man with primary herpes labialis.



**Figure 4**

**Figure 4:** Recurrent genital herpes infection in a 32 year old man.



**Figure 5**

**Figure 5:** Chronic ulcerating vulva herpes simplex infection in a 30 year old HIV positive woman.



**Figure 6**

**Figure 6:** Herpes zoster in a 30-year old HIV positive patient



**Figure 7**

**Figure 7:** Ophthalmic herpes zoster in a 28-year old HIV positive patient



**Figure 8**

**Figure 8:** Condylomata acuminata on glans penis and foreskin of a 30-year old man.



**Figure 9**

**Figure 9:** Condylomata acuminata in a 27-year old rape victim who also tested HIV positive.



**Figure 10**

**Figure 10:** Genital wart in an HIV positive patient



**Figure 11**

**Figure 11:** Seborrheic dermatitis of the face in an HIV positive woman



**Figure 12**

**Figure 12:** Seborrheic dermatitis of the groin in an HIV positive woman



**Figure 13:** AIDS patients with pruritic papular eruption

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#### CONFLICT OF INTEREST

No conflicts of interests were declared by authors.

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