



## **Viral Skin Infections in Adult Patients with HIV/AIDS in a Tropical Rural Practice in Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author TATS designed the study, wrote the protocol and the first draft of the manuscript. Author PE gathered and analyzed the data. Both authors TATS and PE jointly wrote the discussion, corrected and approved the final manuscript.*

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### **ABSTRACT**

**Background:** The skin, like all organs in the body is affected by several diseases in patients with HIV/AIDS. This is particularly so with viral skin disorders where impaired cellular immunity seems to be a common pathway of susceptibility. There are however few documented studies of these conditions in Nigeria and some other neighbouring west African countries.

This study aims to identify these skin disorders in patients attending the adult outpatient clinic in a rural/suburban health centre in the southern part of Nigeria and collate the differences and similarities to other related studies.

**Methods/Design:** This was done among HIV infected adult patients in the outpatient HIV clinic. It was a prospective observational study done in Irrua Specialist Teaching Hospital Irrua Edo State Nigeria. The study was done over a 12 months period. All patients with skin complaints were included in the study while those without were excluded.

**Results:** Nine thousand, four hundred and sixty patients were seen during this period including new and old patients returning for follow up visits. Four hundred and ninety had different

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dermatologic complaints during these visits giving a prevalence of 5.17%. The male:female ratio was 1:1.4 and a mean age of 38±10 years.

One hundred and eighty two of these patients had clinical features of cutaneous viral infections giving a prevalence of 37.1% of cutaneous complaints. Herpes Zoster (27%), Genital warts (19.2%), Plain viral warts (15.4%) and Herpes Simplex (15.4%) are the commonest cutaneous viral pathologies encountered. Others include Pityriasis Rosea (11.5%), *Molluscum contagiosum* (7.7%), and *Varicella zoster* (chicken pox - 3.8%).

**Conclusion:** Viral skin infections are very common in the HIV/AIDS population and they constitute a significant cause of morbidity in these patients.

*Keywords: Cutaneous; viral; HIV/AIDS; pathologies.*

## 1. INTRODUCTION

Infection with the HIV virus can manifest with different dermatologic pathologies and some might actually raise the clinical suspicion of the presence of this infection [1]. These may present with unusual and atypical manifestations in the course of the HIV infection [2]. Viral infections, in particular, are a major cause of opportunistic infections in HIV-infected adults, and can lead to significant morbidity and sometimes mortality [3]. Infection with HIV affects skin diseases considerably, not only by affecting the immune system and thereby host defense against bacterial, viral, or mycotic infections, but also by changing tumor immune response and autoimmune reactivity [4]. Skin lesions particularly viral infections occur more in HIV patients than in the general population and may be more severe [5]. Some lesions are markers of HIV or AIDS and are important signs heralding an improving or declining immune system and the success or failure of antiretroviral therapy [6]. An improved understanding of the incidence of and risk factors for viral infections in HIV-positive patients has important implications for clinical practice.

Cutaneous viral sexually transmitted infection (STI) such as genital warts from human papilloma viral infection significantly increases HIV transmission. This type of infection may be asymptomatic and therefore remain undiagnosed in HIV-positive persons until neoplastic complication arises [7].

The changing pattern of cutaneous viral lesions in association with HIV/AIDS becomes significant as there is a high prevalence of skin and mucocutaneous disorders in affected patients and the recognition of this ultimately improves the care of these patients.

The aim of the study was to determine the pattern of viral skin disorders in adult patients with HIV infection in a rural/suburban part of Edo State Nigeria.

## 2. METHODOLOGY

Adult patients attending the outpatient HIV clinic of Irrua Specialist Teaching Hospital Irrua Edo State Nigeria with skin complaints were recruited into this study. Those without skin complaints were offered the routine HIV care but were excluded from the study. The study was done over a 12 month period beginning from January 2011 and concluded December 31<sup>st</sup>, 2011. An average of 200 patients was seen per week. A consent form was signed by patients included in the study after adequate explanation.

Ethical approval was obtained from the hospital's research and ethics committee.

Simple statistical analysis of percentage and averages were used to interpret the data obtained.

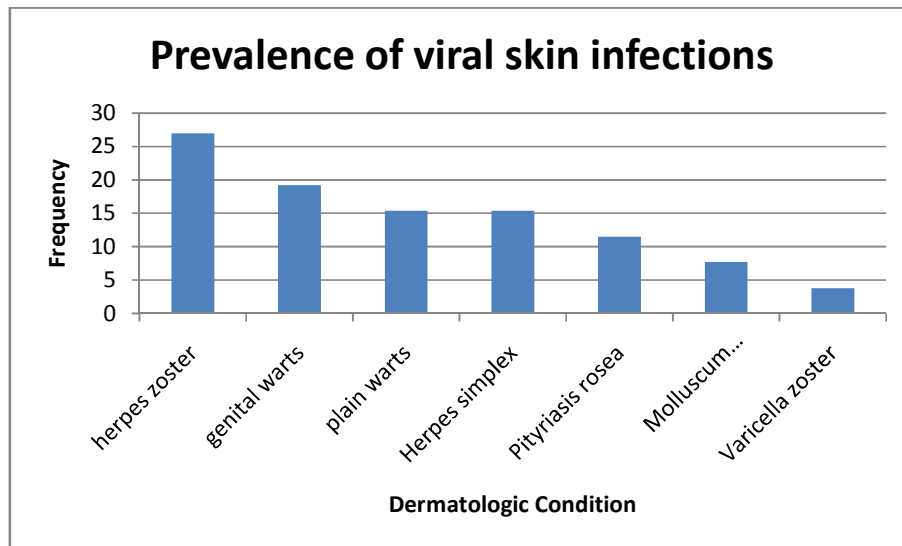
## 3. RESULTS AND DISCUSSION

Nine thousand four hundred and sixty patients were seen during the period of the study. This comprises both new and old patients returning for routine follow up visits. A total of 480 patients (a prevalence of 5.17%) with dermatologic complaints were included in this study. A male: female ratio of 1:1.4(140:350) was found and a mean age of 38±10 years.

One hundred and eighty two of these patients had clinical features of cutaneous viral infections at a prevalence of 37.1% of cutaneous complaints. A breakdown of the various viral skin conditions with the mean CD4 counts is shown in the Table 1 below.

**Table 1. Prevalence of viral skin infections**

| Pathology                    | Frequency | Percentage% | Average CD4 count (cells/ul) |
|------------------------------|-----------|-------------|------------------------------|
| Herpes Zoster                | 49        | 27.0        | 281±67                       |
| Genital warts                | 35        | 19.2        | 176±52                       |
| Plain viral warts            | 28        | 15.4        | 187±66                       |
| Herpes simplex               | 28        | 15.4        | 135±23                       |
| Pityriasis Rosea             | 21        | 11.5        | 250±55                       |
| <i>Molluscum contagiosum</i> | 14        | 7.7         | 30±13                        |
| <i>Varicella zoster</i>      | 7         | 3.8         | 277±56                       |
| Total                        | 182       | 100         |                              |

**Fig. 1. Prevalence of viral skin infections**

Cutaneous complaints occurred in 5.17% of the patients seen in this study (Fig. 1 shows above the graphic distribution of the various viral agents from this study). This is similar to the 5.4% prevalence observed in Enugu south east Nigeria by Nnoruka [8]. A similar socio-demographic characteristic of study locations might be the reason for this observation. However, Yahya [9] recorded a slightly different prevalence of 4.3% among patients in Kaduna North central Nigeria reflecting the dynamic nature of HIV infection in different parts of the country.

Viral skin conditions occurred in 37.1% of patients in this study. This differs from the 29.7% of viral infections found by Lanjewar et al. [10] and 27.8% by Chopa et al. [11] among their cohort of Indian patients' studied. It is clear that both studies have shown that viral skin infections are still accountable for the largest share of the cutaneous pathology. The variation between the studies probably reflects the different patterns of opportunistic infections prevalent in the patients.

Viral infections, are a major cause of opportunistic infections in HIV-infected adults, and can lead to significant morbidity and mortality. This is most likely because cell mediated immunity is important to clear viral infections and HIV infections resulted in deficiency in cellular immunity. Delayed recognition of viral lesions and lack of prompt treatment could also contribute to this high prevalence. According to Tsigrelis et al. [5] the primary reason for high prevalence of viral skin infections may be the lack of access to HAART for most people living with HIV/AIDS. For those patients with access to HAART some may not have an effective response to therapy, due to medication toxicity, poor adherence, or drug-resistant strains of HIV.

### 3.1 Herpes Zoster

Herpes Zoster was observed in 27% of the patients accounting for the highest cutaneous viral pathology. A similar finding was reported by

Josephine et al who observed a 28.1% in their study [12]. Additionally, this infection is the commonest pathology observed among patients from Togo [13] and Dares-Salam [14]. Onunu et al. [15] in Benin city Nigeria had noted earlier that HZ occurs with higher frequency among persons who are seropositive for HIV than among those who are sero-negative. In other parts of the world, the prevalence of HZ is lower but still represents the largest viral infection in HIV infected patient as observed by Sivayathorn et al. [16] who found it in 16.1% of their patients in Thailand. Declining virus-specific cell-mediated immune responses, which occur naturally as a result of aging or are induced by immunosuppressive illness such as HIV infection, predisposes to acquiring this infection [17]. This is evidenced in this study by the mean CD4 count of  $281 \pm 67$  cells/ul indicative of a suppressed immunity. HIV-infected patients have been noted develop HZ more than their age-matched, HIV-uninfected individuals [18]. HZ may occur at any time in the course of HIV-induced immunosuppression, and may be the first clinical clue to suggest undiagnosed HIV infection [19]. An episode of HZ may therefore be an indication to consider the presence of HIV infection.

Recurrent episodes of HZ also may occur in HIV-infected patients, and appear to be more common than in the HIV-uninfected population [17-20].

However the prevalence of *Varicella zoster* (VZ) infection (chicken pox) due to the same virus in this study was 3.8% despite a similar mean CD4 count ( $277 \pm 56$  cells/ul). This probably shows that the baseline prevalence of the virus in the community might be low since VZ represents an acute presentation while HZ is a reactivation of a previously dormant virus, therefore VZ infection may not be an indication of a waning immune system as is HZ infection. Though VZ is a self limiting and mild infection, it can be severe in adults and in individuals with cellular immunodeficiency such as that occasioned by infection with the HIV virus [21]. These individuals are at much higher risk of pneumonia [22] and disseminated disease [23] with visceral involvement though none was observed in this study.

### 3.2 Genital Warts

Genital warts are responsible for the second largest group of viral skin condition noted in this

study occurring in 19.2% of patients. This is higher than the 7% rate found by Katusime et al. [7] in an urban clinic cohort of HIV positive patients. Similarly Low et al. also found 7% prevalence among HIV positive women in Burkina Faso [24]. This probably indicates a reduced transmission rate of HPV infection in the studied population compared to that of this study. HPV infections around the genitalia are common in most parts of the world including the developed countries like the United States of America [25]. This is most likely due to the similarities in acquiring and transmitting HIV & HPV infections.

HPV infections are one of the most common sexually transmitted infections globally, and genital warts, caused by HPV-6 and 11, are particularly associated with the risk of developing complicating neoplasia [26]. HIV infection and associated immunodeficiency are known to alter the course of human HPV infections and of associated diseases [27]. Genital warts occur much more frequently among HIV-1 infected patients particularly women in Africa, particularly among those with low CD4 cell counts [24]. This is confirmed in this study by the observed mean CD4 count of  $176 \pm 52$  cells/ul indicative of advanced immune suppression. HIV infection and immunodeficiency has been known to synergistically modify the relation between HPV 6 or 11 infection and genital wart prevalence [27]. Genital intra epithelial neoplasia is a pathology that is common in patients co-infected with HIV & HPV infection and its occurrence reflects the severity of the subsequent immune suppression [26].

Additionally, cervical and anal HPV infection is more common in HIV positive than in HIV negative population. According to De Vuyst et al. [28] despite the scarcity of high quality cancer registries and lack of reliable mortality data, it is clear that HPV associated diseases, particularly cervical cancer, are major causes of morbidity and mortality in Sub-Saharan Africa (SSA) especially with HIV infection increasing the incidence and prevalence of all HPV-associated diseases. Cervical cancer incidence rates in SSA are the highest in the world and the disease is responsible for the most cancer deaths among women in the region.

### 3.3 Plain Viral Warts

Plain viral warts occur in 15.4% of our patients in this study. It appears common in HIV infected

paediatric patients as noted by Umoru et al. [29] and Salami et al. [30] in Nigeria. Doni et al. [31] however found a lower prevalence of 8% among a cohort of HIV positive children living in an orphanage in Ethiopia.

Scaly hypo or hyperpigmented linear patches and slightly raised plaques that are located on the upper limbs and face are the hallmark of this infection [32]. A dysfunction in cell mediated immunity such as that occasioned by HIV infection is a recognised risk factor to the development of these lesions [32]. This is evidenced in this study by the observed mean CD4 count of  $187 \pm 66$  cells/ul.

Herpes simplex viral infections also occur in 15.4% of the patients in this study. This is similar to the 17.7% found by Goh et al. [33]. This is in contrast to the 10.9% found by Sivayathorn et al. [16]. In both studies however, it still represents one of the commonest cutaneous manifestations among their cohorts of HIV infected patients. Herpetic infections are a common group of infections in this environment however it assumes a special significance in the HIV population as it can present with flord and systemic manifestation. The mean CD4 count of  $135 \pm 23$  cells/ul observed in this study might be the reason why this otherwise benign viral infection might result into a life threatening infection in patients with HIV infection.

### 3.4 *Molluscum contagiosum*

*Molluscum contagiosum* (MC) accounted for 7.7% of the viral infection seen in this study. This is lower than the 21% found by Doni et al. [31] among HIV infected children in Ethiopia. It tends to occur more in children as confirmed by other researchers in paediatrics patients with HIV infection [34-36]. MC is generally less common in adults unless the immune system is compromised with conditions such as HIV infection or malignancy. The mean CD4 count of  $30 \pm 13$  cells/ulis the lowest value recorded in this study and confirms the degree of advanced immune suppression found in patients with MC. In adult HIV patients with MC, there is a general tendency to occur in unusual sites such as the eyes as noted by Emina et al. [37].

### 3.5 Pityriasis Rosea

Pityriasis Rosea (PR) like lesions was found in 11.5% of our patients with a mean CD4 count of  $250 \pm 55$  cells/ul. Its etiology has been linked to

the human herpes virus 7(HHV-7), reported in 1990 as a lymphotropic member of the beta herpes virus subfamily of herpes viruses [38,39]. The virus is a highly sero-prevalent, primary infection that usually occurs in children and young adults. The effect and prevalence of this virus on cutaneous tissue has been poorly researched particularly as regards its occurrence in patients with HIV infection. Several reviews on cutaneous manifestations of HIV infection have mentioned the occurrence of pityriasis rosea occurring in patients with HIV infection. Staughton even speculated that its features might be an acute seroconversion illness of HIV infection [40]. The effects of HHV-7 infection on the cells are varied. This includes regulation of interleukin 15 and modulating the CD4 T-Lymphocytes that attracts the virus similar to what happens with the HIV infection [41].

## 4. CONCLUSION

In conclusion, cutaneous viral infections are a common presentation in the HIV/AIDS population and their presence may be the first pointer of HIV infection or maybe a pointer of a deteriorating immune system that will require prompt attention without which it may herald significant morbidity or may eventually be a precursor of a malignant transformation. Its prompt recognition and appropriate and adequate attention reduces these endpoints. Knowledge of the changing pattern of cutaneous viral lesions in association with HIV/AIDS may help the clinical dermatologist and venerologist to identify these dermatoses and act in the most appropriate manner to support the patient particularly as there is a high prevalence of skin and mucocutaneous disorders in patients with HIV infection. An early detection of these lesions optimizes the care of many of these opportunistic cutaneous disorders and improves the patients' quality of life.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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