

A Comparative Study of the Pattern of Mucosal and Skin Disorders in HIV-Infected and Non-HIV-Infected Children in Port Harcourt, Nigeria.

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Abstract:

Background: The burden of mucosal and skin disorders is high among children all over the world and the advent of the Human Immunodeficiency virus (HIV) infection and Acquired Immune Deficiency Syndrome (AIDS) has further compounded this burden and diversity. The aim of this study was to determine and compare the pattern of mucosal and skin disorders in HIV-infected children with that in non-HIV-infected children receiving care in two tertiary hospitals in Port Harcourt.

Materials and Methods: This was a cross sectional study carried out over a six month period. Study participants consisted of 372 HIV-infected children and 372 age, sex and socio-economic class matched non-HIV-infected children who served as a comparison group. Diagnosis of mucosal and skin disorders were mainly clinical but relevant laboratory investigations were conducted when necessary.

Results: The prevalence of mucosal and skin disorders in HIV-infected children was 30.1% which was significantly higher than the 11% reported in the non-HIV-infected group ($\chi^2 = 41.447, p = 0.0001$; OR=3.43, 95% CI=2.32-5.09). Whereas fungal and inflammatory disorders were the predominant lesions in the HIV-infected group, infestations and bacterial disorders were the most common lesion in the comparison group. This difference in aetiologic agents was statistically significant. The three most common disorders in HIV-infected children were pruritic papular eruptions (9.1%), Verruca plana (5.1%) and Tinea capitis (4.6%) while the most common in the non-HIV-infected group were Scabies (4.8%), Impetigo (1.6%) and Atopic dermatitis (1.1%).

Conclusion: Mucosal and skin disorders were significantly more common in HIV-infected children than the non-HIV-infected in this study. A knowledge of the pattern will aid early recognition and treatment so as to limit morbidity and mortality.

Key Word: Pattern, mucosal, skin, disorders, HIV-infected, children, Port Harcourt

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I. Introduction

Mucosal and skin disorders are common in children all over the world.¹ They constitute an important cause of morbidity leading to loss of school attendance, physical pain, disfigurement and negative psychological consequences such as low self-esteem and depression.¹⁻³ The aetiologic agents of mucosal and skin diseases in children are broadly categorized as infectious, inflammatory, neoplastic and others.⁴ The infectious disorders are further subdivided into bacterial, fungal and viral infections and infestations.⁵

The epidemiological pattern of mucosal and skin disorders in the general population of children varies in different regions of the world.⁶ This is often influenced by genetics, environmental differences, sociodemographic factors, hygiene and cultural variations. Among HIV-infected children, the pattern is furthermore influenced by HIV-related factors such as the viral load and degree of immunosuppression.⁶ The mechanism of mucosal and skin disorders in HIV-infected children has been attributed to the direct and indirect virus mediated destruction of the mononuclear defense system of the skin leading to immune dysregulation in the skin.⁷

Among the general population of children, the pattern and prevalence of mucosal and skin disorders varies with non-infective lesions such as atopic dermatitis and pigmentary lesions predominating in studies from developed countries.⁸⁻¹⁰ In contrast, infections and infestations have been reported as the predominant lesions in the developing countries.¹¹⁻¹³ The prevalence of mucosal and skin disorders in the general population of children ranges from 16.3% to 72.3%.^{3,11,14} The burden of mucosal and skin disorders is however disproportionately higher in HIV-infected patients and may affect up to 90% of them at some point in the course of their illness.¹⁵ This burden in HIV-infected is also noted to vary from region to region. Studies done

in North America¹⁶ and elsewhere in Africa¹⁷ reported prevalence rates of 77% and 85% respectively while prevalence rates from previous Nigerian studies ranged from 13.1% to 53%.¹⁸⁻²¹

The aim of our study was to determine and compare the pattern of mucosal and skin disorders in HIV-infected children with that in non-HIV-infected children receiving care in two tertiary hospitals in Port Harcourt. The findings from this study will help strengthen the capacity of clinicians managing both HIV-infected and non-HIV-infected children to recognize these mucosal and skin disorders so as to administer the appropriate treatments to limit morbidity and mortality.

II. Material And Methods

Study Design

This was a descriptive cross sectional study carried out over a six month period.

Study Area

The study was conducted at the Paediatrics infectious diseases clinics of the University of Port Harcourt Teaching Hospital and the Rivers State University Teaching Hospital. Both hospitals are tertiary care facilities located in the city of Port Harcourt in Southern Nigeria.

Study Population

The study participants consisted of 372 HIV-infected children aged six weeks to 18 years and 372 age, sex and socioeconomic class matched non-HIV-infected children who served as a comparison group. Children who were aged less than six weeks of age whose HIV status had not been confirmed by HIV DNA PCR were excluded from the study.

Sampling Method

Out of the 597 HIV infected children attending the Paediatric HIV clinic in the two hospitals, 372 study subjects were recruited by simple random sampling. Thereafter, 372 non-HIV-Infected children who served as a comparison group were recruited consecutively. This was done after matching the comparison group to HIV-infected group with respect to for age, sex and socioeconomic class. Socioeconomic class was determined using the method developed by Oyediji et al.²² The sample size for the study was derived from the prevalence of mucocutaneous disorders in HIV-infected children as reported in a previous Nigerian study.²³

Procedure Methodology

Socio-demographic and relevant clinical data were obtained using an interviewer administered, semi-structured questionnaire. This was followed by a complete dermatological examination of the children to identify the presence of mucosal and skin lesions. Diagnosis of mucocutaneous disorders were mainly clinical while relevant microbiological and histopathological specimen were obtained as appropriate.

Data analysis

Data analysis was conducted using IBM SPSS version 25.0. Results of descriptive statistics were reported using frequency tables and charts. Categorical variables were compared using Chi Square test.

Ethical Consideration

Ethical approval for the study was obtained from the Research Ethics Committee of both health institutions and written informed consent obtained from the parents or guardians of all participating children. Assent was obtained from children aged seven years and above.

III. Results

The study subjects consisted of 372 HIV-infected children and 372 non-HIV-infected children with a male to female ratio of 0.8:1. Majority of the study participants belonged to the low socio-economic class (Table I). The mean age of HIV-infected subjects was 9.98±4.60 years while the mean age of non-HIV-infected subjects was 10.00±4.61 (t=0.073, p=0.941).

The prevalence of mucosal and skin disorders among HIV-infected subjects was 30.1% which was significantly higher than the 11.0% seen in non-HIV-infected subjects ($\chi^2 = 41.447, p = 0.0001$; OR=3.43, 95% CI=2.32-5.09). Table II shows that Fungal disorders were the predominant lesions seen in HIV-infected subjects while infestations were the leading disorders in the non-HIV-infected group (Chi Square=49.258; p-value=0.0001). The commonest disorder in HIV-infected children was pruritic papular eruptions (9.1%) while scabies (4.8%) was the leading disorder in the comparison group (Figures 1 and 2).

Table I: Socio-demographic Characteristics of the Study Subjects

Variable	HIV-infected N = 372 n (%)	Non HIV-infected N = 372 n (%)	Total N = 744 n (%)	Chi Square	p-value
Age category					
< 1-6years	94 (25.3)	94 (25.3)	188 (25.3)	0.075	1.000
7 – 12years	167 (44.9)	166 (44.6)	333 (44.8)		
13 – 18 years	111(29.8)	112 (30.1)	223(29.9)		
Gender					
Male	169 (45.4)	169 (45.4)	338 (45.4)	0.000	1.000
Female	203 (54.6)	203 (54.6)	406 (54.6)		
Socio-economic class					
High	91 (24.5)	91 (24.5)	182 (24.5)	0.000	1.000
Middle	134 (36.0)	134 (36.0)	268 (36.0)		
Low	147 (39.5)	147 (39.5)	294(39.5)		

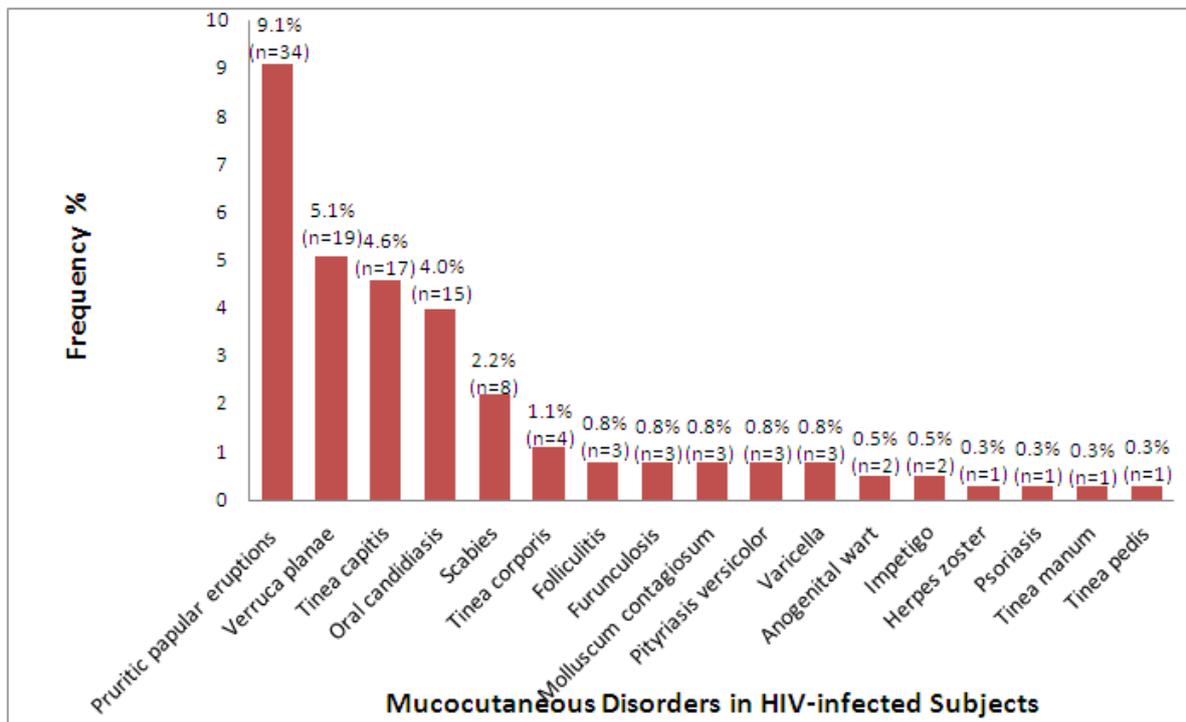


Figure 1: Mucocutaneous Disorders seen in HIV-Infected Study Subjects

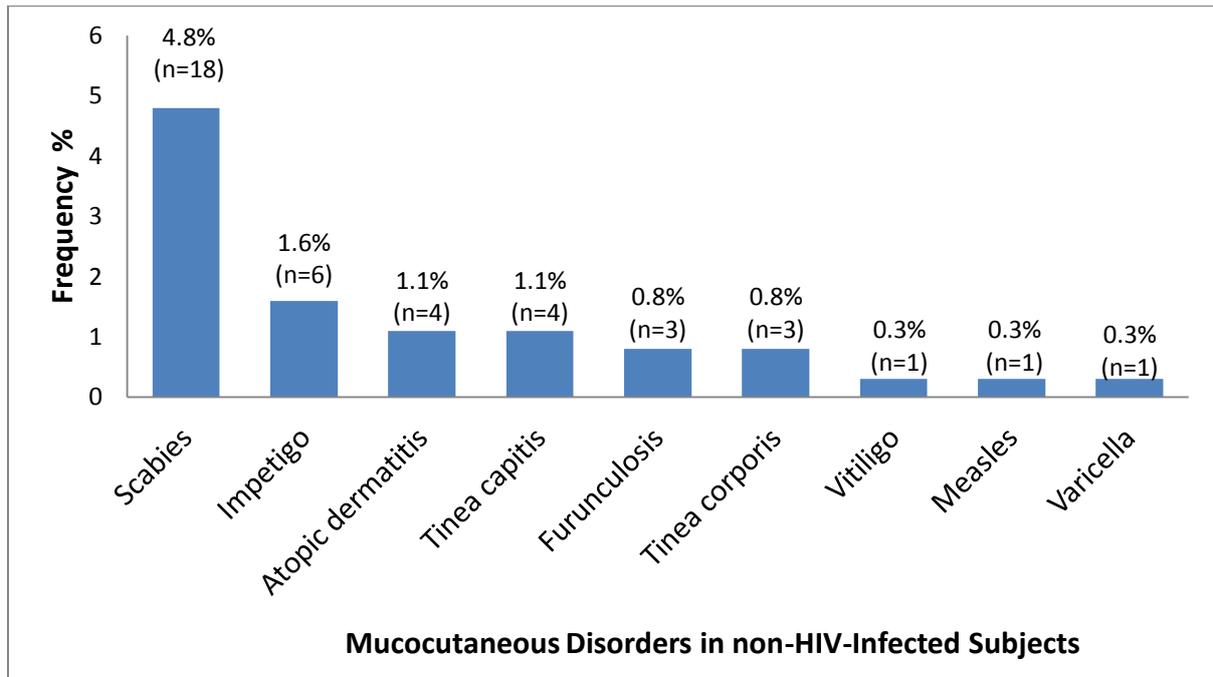


Figure 2: Mucocutaneous Disorders seen in Non-HIV-Infected Study Subjects

Table II: Comparison of the Categories of Mucocutaneous Disorders by aetiology seen in Study Subjects

Category	HIV-infected n (%)	Non HIV-infected n (%)	Total n (%)
Fungal	41 (34.2)	7 (17.1)	48 (29.8)
Viral	28 (23.3)	2 (4.9)	30(18.6)
Bacterial	8 (6.7)	9 (21.9)	17 (10.6)
Infestation	8 (6.7)	18 (43.9)	26 (16.2)
Inflammatory	35 (29.1)	4(9.8)	39 (24.2)
Others	0 (0.0)	1 (2.4)	1 (0.6)
Total	120 (100.0)**	41 (100.0)	161 (100.0)

Chi Square=49.258; p-value=0.0001* *Statistically significant

**Among the 112 HIV-infected subjects with mucocutaneous disorders, 8 of them had 2 mucocutaneous disorders bringing the total number of lesions to 120.

IV. Discussion

In the present study, the prevalence of mucosal and skin disorders among HIV-infected subjects was 30.1%. This finding was lower than the prevalence reported by Osinaike *et al.*,²⁴ in Lagos (83%), Endayehu *et al.*,⁶ in Ethiopia (72.6%) and Nair *et al.*,²⁵ in India (66.15%). The lower prevalence of mucosal and skin disorders reported in HIV-infected subjects in this study may be explained by the fact that all the children were on HAART as currently recommended by the World Health Organization (WHO) and the Nigerian Agency for the Control of AIDS (NACA).^{26,27} This is in contrast to the above studies in comparison in which use of HAART among the HIV-infected children studied ranged from 0% in study by Nair *et al.*,²⁵ in India to 74% in a Tanzanian study.¹⁶

Furthermore, the prevalence of mucosal and skin disorders was significantly higher in HIV-infected subjects compared to the non-HIV infected subjects. This may be expected as HIV-infection has deleterious effects on the immunological function of the skin and the mucous membrane. . This finding is comparable to

that reported by Umoru *et al.*,²³ in Benin City where mucosal and skin disorders were reported in 64% of HIV-infected children which was significantly higher than the 12% reported in non-HIV-infected children.

Infectious disorders were noted as the most common mucosal and skin disorders seen the HIV-infected and non-HIV-infected subjects. Despite this similarity, there were variations in the aetiologic categories of the mucocutaneous disorders seen in the two groups. Among HIV-infected subjects, fungal and viral mucocutaneous disorders were the most common infectious disorders seen and their prevalence was also significantly higher than in the non-HIV-infected comparison group. In contrast, infestations and bacterial disorders were the predominant infectious disorders seen in the non-HIV-infected subjects and their prevalence was also significantly higher in this group than in the HIV-infected group. The use of cotrimoxazole as a prophylaxis for some opportunistic infections such as Pneumocystis jiroveci pneumonia, Toxoplasmosis, Isosporidiasis etc among some of the HIV-infected subjects may have contributed to the lower prevalence of bacterial disorders recorded among this group in the present study.

With respect to specific mucosal and skin disorders, pruritic papular eruptions (PPE) was the most commonly occurring mucocutaneous disorder encountered in HIV-infected subjects in this study. The exact aetiology of this condition remains unknown. Some authors have suggested that it may result from an exaggerated hypersensitivity reaction to arthropod (mosquitoes) salivary antigen or may be a direct effect of the HIV infection.^{18,28}

In contrast, Scabies was the most common mucosal and skin disorder seen in the non-HIV-infected subjects. The high prevalence of scabies is comparable to findings by other authors among the general population of children in some developing countries.²⁹⁻³¹ This may be partly explained by the high prevalence of overcrowding and poor hygiene seen in these resource limited countries.

V. Conclusion

This study shows that among HIV-infected children attending UPTH and RSUTH, mucosal and skin disorders were significantly more prevalent compared to the non-HIV-infected children. There was however a difference in the aetiologic agents of mucocutaneous disorders seen in these two groups. Whereas fungal disorders were the predominant lesions in HIV-infected children, infestations were the leading lesions in the comparison group. A knowledge of the pattern of mucosal and skin disorders among HIV-infected and non-HIV-infected children will help in early recognition and treatment of these lesions so as to limit morbidity and mortality.

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