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The Pattern, Risk Factors And Predictors of Oral Manifestations of HIV Among Highly Active Antiretroviral Therapy Naive Patients

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***Abstract**: It has been estimated that 90% of people with HIV disease will present with at least one oral manifestation sometimes during the course of their infection. Oral manifestations were among the early documented signs of HIV infection and over 40 manifestations have been described. Oral manifestations can serve as clinical correlates of CD4 count and viral load. The aim of this study is to determine the prevalence, pattern, risk factors and likely predictors of oral manifestations among HIV patients. A total of 207 adult HIV seropositive subjects who were HAART naïve and gave informed consent were recruited for the study. A researcher administered questionnaire was used documenting patient's socio- demographic characteristics and past medical history, which included the oral cavity. Oral examination was carried out and the clinical diagnosis of oral findings were based on the European Community and WHO collaborating centre on oral manifestations of HIV. Data was analyzed using SPPS version 22.The mean age for males was significantly higher than that for females. More females were in the lower age category, were singles, widows and traders. The prevalence rate of oral lesions was 32.4% with oral thrush being the commonest lesion observed. More females had oral lesions compared to the males. More males indulged in alcohol, smoking and use of cannabis. Lower CD4 count of <200 cells/µl was associated with pain on swallowing and oral lesions. Higher CD4 count > 200 cells/µl was associated with swollen gums. Lower CD4 count was closely a predictor of oral lesions among the studied population.The prevalence of oral lesions was 32.4% with oral thrush being the commonest lesions observed. Lower CD4 count below 200 cells/ul was associated with oral lesions and was closely a predictor of oral manifestations among the HIV patients.*

***Keywords:** Adults, HAART Naïve, HIV, Oral Manifestations.*

I. Introduction

Globally, 35.0 million (33.2-37.2 million) people were living with Human Immunodeficiency Virus (HIV) at the end of 2013. [1] Since the beginning of the epidemic, almost 78 million people have been infected with the HIV virus and about 39 million have died of HIV. Sub Saharan Africa remainsthe most severely affected region with nearly 1 in every 20 adults living with HIV and accounting for nearly 71% of the people living with HIV worldwide. [1] Nigeria has an adult HIV prevalence rate of 3.1% as at 2012. [2] HIV infects the immune system and destroys the T helper lymphocytes. This makes the affected individual more susceptible to infections that an otherwise healthy body could fight. Cutaneous manifestations which may be the initial signs of virus-related immune suppression, frequently occur in patients who are HIV infected. The oral cavity is an important and frequently under-valued source of diagnostic and prognostic information in patients with HIV disease. [3] It has been estimated that 90% of people with HIV disease will present with at least one oral manifestation sometimes during the course of their infection. [4] The ability to differentiate one manifestation from another as well as manage some of the more common conditions is fundamental to the overall healthcare of this patient population. Perhaps, no singular event has had a profound impact on oral health and oral health-care delivery as the Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDS) pandemic.[5]

Oral manifestations were among the early documented signs of HIV infections and over 40 manifestations have been described. [5,6] Oral manifestation may represent the first sign of the disease. [5] Oral

manifestations can serve as clinical correlate of CD4 count and viral load as these two parameters are highly predictive markers of severe immune deterioration and disease progression. In addition, they can also serve as criteria for entry into clinical trials. [6,7]

Oral manifestations are also included in the natural history, staging and classification schemes for HIV infection. [8] Studies of oral conditions associated with HIV infection in adult Nigerians reported prevalence rates ranging from 20% in 2001 to 84% in 2006 [9]. Oral manifestations may be used as an alternative to CD4 count at field based settings to determine the immune status of HIV infected individuals [10, 11, 12].

The aim of this study was to determine the pattern, risk factors and likely predictors of oral manifestations among newly diagnosed HIV seropositive HAART naïve adult attending the Special Treatment Clinic (STC) of the University of Calabar Teaching Hospital (UCTH) in Cross River State, Nigeria.

II. Methodology

This was a cross sectional descriptive hospital based study. The study site was the Special Treatment Clinic of the UCTH, a tertiary health facility. Newly diagnosed adult HIV seropositive subjects who were HAART naïve and gave written informed consent were recruited into the study. Ethical approval for the study protocol was granted by the Health Research Ethical Committee (HREC) of the UCTH on the 11th of April 2016 before commencement of the study. Consenting participants were recruited over an 8 month period from July 2016 to March 2017. A researcher administered questionnaire documenting socio-demographic variables of the patients and other relevant data was used. A careful and detailed history of the oral cavity and past medical history was taken and findings noted. Oral examinations were carried out by the authors using head lamp in a well lighted room with subjects sitting in an upright chair with back rest.

Infection control was maintained by the use of disposable latex examination gloves, sterile pre-packaged tongue depressors and a disposable facemask for each patient. Clinical diagnoses of oral findings were based on the WHO classification and diagnostic criteria for oral lesions in HIV infection.[13] This classification of oral manifestation of HIV infection is based on their strength of association with the presence of HIV infection..

2.1 Data Analysis

The data obtained was analyzed using Statistical Package For Social Sciences (SPSS) version 22. Quantitative data are presented as mean ± S.D and categorical variables as percentages. Statistical comparison was done using Chi – square test and logistic regression was used to determine the predictors of oral manifestations. Significant levels were set at $p < 0.05$.

III. Results

Table 1: Clinical and demographic characteristics of participants

Variables	Male (n=85), Mean±SD, %	Female (n=122), Mean±SD, %	p-value
Age (years)	39.6±11.4	34.5±10.5	0.001
CD4(cells/µl)	204.9±130.7	224.7±166.9	0.340
Age category (years)			
18 – 38	41(32.0)	87(68.0)	
39 – 59	37(55.2)	30(44.8)	0.003
60 above	7(58.3)	5(41.7)	
Marital status			
Single	25(31.3)	55(68.7)	
Married	50(55.6)	40(44.4)	0.001
Divorced	6(40.0)	9(60.0)	
Widower/Widower	4(18.2)	18(81.8)	
Educational status			
No formal education	3(42.9)	4(57.1)	
Primary	23(51.1)	22(48.9)	0.139
Secondary	35(33.3)	70(66.7)	
Tertiary	24(48.0)	26(52.0)	
Occupation			
Student	5(41.7)	7(58.3)	
Farmer	5(38.5)	8(61.5)	
Trader	11(14.9)	63(85.1)	
Civil servant	11(52.4)	10(47.6)	0.0001
Public servant	9(81.8)	2(18.2)	
Artisan	37(60.7)	24(39.3)	
Unemployed	7(46.7)	8(53.3)	
Religion			
Christian	84(41.2)	120(58.8)	0.633
Islam	1(33.3)	2(66.7)	
Cigarette smoking			
Yes	24(96.0)	1(4.0)	0.0001

No	61(33.5)	131(66.5)	
Alcohol use			
Yes	62(47.0)	70(53.0)	0.022
No	23(30.7)	52(69.3)	
Substance abuse			
Cannabis	22(59.5)	15(40.5)	
Others	0(0.0)	1(100.0)	0.028
None	63(37.3)	106(62.7)	
Oral lesion			
Yes	24(35.8)	43(64.2)	0.289
No	61(43.6)	79(56.4)	

Table 1 shows that the mean age for males was significantly higher than that for females, but more females were in the lower age category(18 – 38), singles, widows, and traders, all these were statistically significant ($p < 0.05$). However, more males indulge in smoking, use of alcohol and cannabis ($p < 0.05$). The presence of oral lesion was more in females as compared to males but this was not statistically significant.

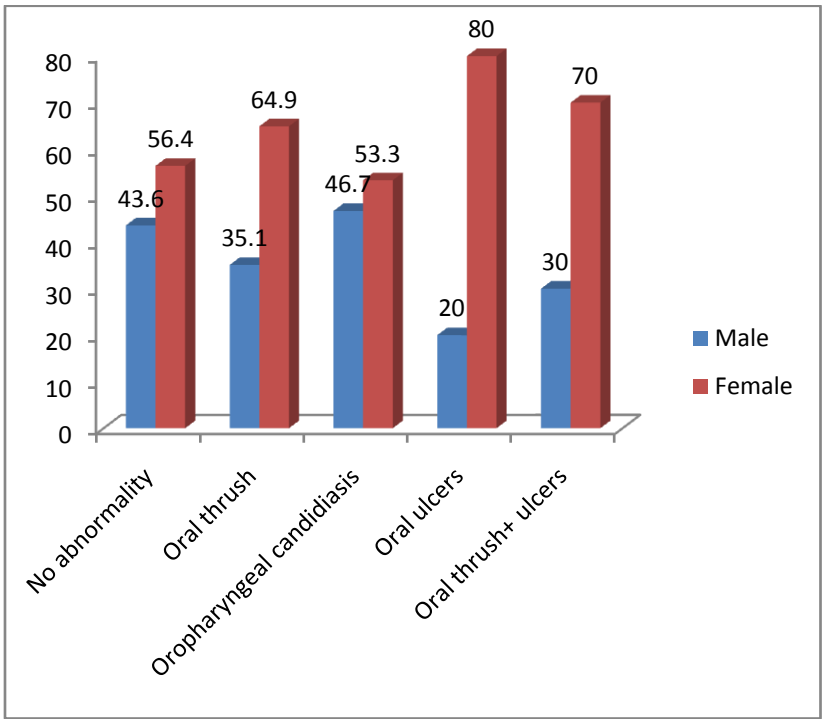

Figure 1: Examination findings of oral lesions

In figure 1, the various types of oral lesions were seen more among the female participants with oral thrush, oropharyngeal candidiasis, oral ulcers and oral thrush + ulcers making up 64.9%, 53.3%, 80% and 70% respectively.

Table 2: Pattern of oral manifestations in relation to CD4 count levels

Variables	CD4 < 200 (n = 117), %	CD4 above 200 (n = 90), %	p-value
Pain on swallowing			
Yes	29(70.1)	12(29.3)	0.040
No	88(53.0)	78(47.0)	
Swollen gums			
Yes	1(14.3)	6(85.7)	0.018
No	116(58.0)	84(42.0)	
Bleeding gum			
Yes	21(53.8)	18(46.2)	0.708
No	96(57.1)	72(42.9)	
Oral ulcers			
Yes	21(84.0)	4(16.0)	0.002
No	96(52.7)	86(47.3)	
Growth in the mouth			
Yes	3(100.0)	0(0.0)	0.063
No	114(55.9)	90(44.1)	
Examination findings			

No abnormality	60(42.9)	80(57.1)	
Oral thrush	30(81.1)	7(18.9)	
Oropharyngeal thrush	13(86.7)	2(13.3)	0.0001
Oral ulcers	5(100.0)	0(0.0)	
Oral thush + ulcers	9(90.0)	1(10.0)	

In table 2, lower CD4 count levels of less than 200cells/µl were significantly associated with the presence of pain on swallowing, oral ulcers, growth in the mouth and the examination findings of oral thrush ($p < 0.05$). However, higher CD4 count above 200cells/µl was significantly associated with the presence of swollen gums ($p < 0.05$).

Table 3: Predictors of oral manifestations in HIV patients

Variables	Odds ratio	95% CI	p-value
Sex (1)	1.212	0.570 – 2.576	0.617
Age	1.023	0.956 – 1.095	0.505
Age Cat	-	-	0.839
Age Cat (1)	1.691	0.111 – 25.768	0.706
Age Cat (2)	1.712	0.242 – 12.124	0.590
Smoking (1)	1.583	0.464 – 5.401	0.464
Alcohol (1)	1.090	0.550 – 2.160	0.805
CD4 count	1.005	1.000 – 1.011	0.064
CD4 Cat (1)	0.435	0.113 – 1.677	0.227
HTN (1)	0.677	0.187 – 2.448	0.552
DM (1)	1.985	0.166 – 23.71	0.588

In this logistic regression model analysis in table 3, with the presence of oral lesion as the dependent variable, lower CD4 count level is closely a predictor of oral lesion in HIV positive patients.

IV. Discussion

The mean age for males was significantly higher than that for females. This was in keeping with findings from a similar study.[14] Also more females were in the lower age category. This was not surprising for several reasons. Females usually have sexual debut earlier than their male counterparts and the major mode of HIV transmission in this environment is predominantly through the heterosexual route. This has been reflected in several studies. [14,15,16]

Moreso, women are more likely than men to have relationship with older partners for monetary gains, maturity and understanding by older partners and security.[17] Also, young people are vulnerable to acquiring HIV infection because they are more likely to engage in high risk behaviour, by having multiple sexual partners, unprotected sexual intercourse among other vices.[18] Physiologically, women are more vulnerable to HIV infection than men.[19] A study in Nigeria showed HIV prevalence rate of 3.4% among currently married and single women.[20] This was in contrast to our study findings which revealed that more females were singles, corroborating findings from a similar study.[21] Single women may be more prone to vulnerable vices than their married counterparts who may have limitations and certain checks because of their marital status.

In keeping with our study findings, the AIDs epidemic has worsened the situation of widowhood especially among women in studies carried out in Uganda and Zimbabwe.[22,23] Significantly, more females were traders. The rates of employment of women in the formal economy are generally lower than men. The informal sector is a larger source of employment for women than for men and it is growing.[24] However, in the majority of cases in Africa the informal economy is associated with high levels of poverty and social inequality. These factors translate to high rates of HIV/AIDs transmission.[25] The prevalence of oral lesions in our study subjects was 32.4%. Literature review revealed varying rates ranging from of 40.2% - 82.2% in similar studies on HAART naïve HIV subjects.[14,26,27,28] Prevalence rates of 23% and 40.3% were reported in some studies whose subjects were on HAART. [29,30] These findings are at variance with a study which found that HIV patients who were on HAART were less likely to develop oral lesions than those who were HAART naïve.[30]

The difference in the prevalence rate of oral lesions in the other studies have been attributed to duration of HIV seropositivity, nutritional and socioeconomic status, sexual orientation and practices, oral habits, race, gender, drug therapy, genetics and variation in diagnostic criteria.[31,32] In keeping with results from a similar study, oral lesions were seen more in females than males.[27] This is in contrast to another study where lesions were more in men than women.[32] Oral candidiasis was the commonest oral lesion in our study. This finding was observed in several studies.[14,26,27,28,29]

As observed in our study, declining CD4 count levels was associated with oral manifestations in these group of patients, which are keeping with reports from similar studies .[26,28,30] This may be attributable to immune decline with the body being invaded by opportunistic organisms. Lower CD4 count level was closely a predictor of oral lesions in our study findings. It was noted that lower CD4 count levels were associated with

pain on swallowing. This could be as a consequence of oropharyngeal candidiasis in these patients. However, higher CD4 count levels were associated with swollen gums in our study results.

V. Conclusion

In conclusion, oral lesions were more in women than men. More females were in the lower age category, and were singles, widows and traders.The prevalence of oral lesions was 32.4% with oral thrush being the commonest lesions observed. Lower CD4 count below 200 cells/µl was associated with oral lesions and was closely a predictor of oral manifestations among the HIV patients.

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