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Research Article

ORAL AND PERIODONTAL MANIFESTATIONS AMONG HIV POPULATION IN SOUTHERN INDIA

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ABSTRACT
Human immunodeficiency virus (HIV) infection is associated with oral manifestations of diagnostics and prognostic importance. HIV infection has been considered a modifier of periodontal disease. The aim of our study was to report the prevalence of oral manifestations, to investigate the association between periodontal diseases with various parameters. A total of 200 HIV infected patients in the range of 3-64 years, of which 108 males and 92 females were enrolled in the study. Oral examination was carried out considering presumptive criteria by EC-Clearinghouse and subjects were grouped according to centre of disease control after obtaining CD4 cell count. Oral lesions detected most frequently included Oral candidiasis, hyper pigmentation, linear gingival erythema and necrotizing ulcerative gingivitis. No existent correlation found between prevalence of HIV associated periodontal disease and immune of HIVpatients. Oral candidiasis, hyperpigmentation, linear gingival erythema and necrotizing ulcerative gingivitis are common in southern India. The periodontal disease prevalence is more in HIV infected patient irrespective of age, gender, heterosexual or homosexual and with any immune status.

Key Words: *HIV, Periodontal Disease, CD4 Cell Count, Oral Candidiasis, HSV Infection*

INTRODUCTION

Since the first reports of Human immunodeficiency virus (HIV) infection in 1981, the importance and frequency of the associated oral manifestations have been recognized. In the sense, some of these lesions may be of predictive value, warning of a progression from HIVseropositivity to clinically manifest acquired immunodeficiency syndrome (AIDS). Oral manifestations of HIV infection have commanded much attention in recent years from the dental community, because oral manifestations are most common in the early stages of infection even before the diagnosis of HIV is done. AIDS is caused by the Human immunodeficiency virus (HIV) with single stranded RNA lentivirus, which is a class of retrovirus. HIV/AIDS is a serious disorder of the immune system in which the body's normal defenses against infection is broken down, leaving it vulnerable to a host of life threatening infections or conditions (Mumbai AIDS control board, 2006). Till date, all the ingenuity of man, money, effort & power has not found a way to counter the relentless onslaught of HIV which respects no territorial boundaries, makes no distinction between race, creed or color and spares neither the rich nor the poor. In some regions, HIV/AIDS is driving ever-larger parts of nations towards destitution.

HIV associated (specific form) periodontal diseases have been reported in HIV infected persons including linear gingival erythema, necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis, which are shown to occur more intensely in seropositive patients. India is at the third rank among the worlds highest HIV/AIDS population after South Africa & Nigeria comprising about 2.39 million people. In India the highest prevalence of HIV/AIDS cases has been observed in southern India in Andra Pradesh and Karnataka according to latest national AIDS statistics (NACO, 2012).In spite of high prevalence of HIV infection and oral manifestations, there are very few reports of periodontal diseases in south Indian HIV/AIDS patients correlating to their CD4 cell count and dependent parameters which are important in early diagnosis and management of these patients. There is a need to evaluate till what extent the specific form of periodontal diseases are prevalent in south Indian HIV infected patients in relation to their CD4 cell count and to correlate the findings with that reported in other countries.

The present study is aimed at assessing the prevalence of oral manifestations in HIV infected individuals and also to investigate the association of specific form of periodontal diseases to various demographic variables as age, gender, CD4 cell count and risk group.

MATERIALS AND METHODS

This cross sectional epidemiologic study was conducted in Hubli-Dharwad district in Karnataka at Jeevanmukhi, a non government organization for registered HIV infected individuals. The study population consists of 200 HIV infected patients.

Inclusion Criteria

1. Patients diagnosed as HIV positive by at least two positive Enzyme linked immunosorbent assay (ELISA) test & which is confirmed by Western blot test.
2. Those patients who fulfilled the World health organization (WHO) criteria for field diagnosis of AIDS/HIV (WHO, 2012).

Exclusion Criteria

1. HIV/ AIDS patients who were on antimycotic or antiherpetic agents, antibiotics & Non steroidal anti-inflammatory drugs (NSAIDs) during 2 weeks before the oral examination.
2. Pregnant women and lactating mothers.
3. Previous history of periodontal treatment in the past 6 months
4. Smokers, alcoholics & tobacco chewers.

The oral examination was carried out within 24 hours following the assesment of CD4 cell count at HIV clinic. Examination was carried out by investigator himself and was accompanied by 2 trained assistants. The demographic data was collected by using preperformed Performa for examination, after obtaining required information the patients were classified into three groups according to CDC(centre for disease control 1993) classification .The EC clearing house classification and diagnostic criteria for oral lesions in HIV infections (EC clearing house on oral problems related to HIV infections and collaborating centre on oral manifestations of human immunodeficiency virus, 1993) were used in the study. Statistical analysis was performed with chi square test.

RESULTS

The demographic and clinical characteristics of 200 HIV infected patients we examined are discussed in table1. The overall findings for the prevalence of the oral manifestations seen in our study are in table2. In 200 HIV infected patients, one hundred fifty seven (78.5%) patients had HIV associated oral manifestations which included forty eight (24%) patients with oral candidiasis, thirty nine (19.5%) patients with oral ulcerations, seven (3.5%) patients with herpes simplex viral infection. Twenty five (12.5%) patients reported with specific form of periodontal diseases associated with HIV infection, which included eighteen (9%) patients with (LGE) linear gingival erythema and seven (3.5%) patients with necrotizing ulcerative gingivitis (NUG).Twenty five (12.5%) patients had combination of oral candidiasis and ulcerations. In addition to lesions included in revised classification of European committee of clearinghouse, other manifestations also seen were angular cheilitis, atrophic glossitis and ulcers on the lips in 43(21.5%) patients (Table-2). Among the study population twenty five (12.5%) patients had shown the presence of specific forms of periodontal diseases which included the eighteen (9%) patients with linear gingival erythema and seven (3.5%) patients with necrotizing ulcerative gingivitis. Majority of patients had CD4 count below 200 cells/mm^3.No statistical significance was noted between specific form of periodontal disease and CD4 cell count (chi square=3.8487, p=0.1459) (Table-3). Among seven HIV infected individuals who reported with NUG (necrotizing ulcerative gingivitis), more patients were found in the 50-60 years age group. The majority of individuals reported with specific form of periodontal disease were in the age group of 20-40 years. No statistical significance was noted between the age group and prevalence of specific form of periodontal disease (chi square=12.0270, p=0.44356) (Table-4).

Table 1: **Distribution of demographic data of HIV infected patients**

Age	No of subjects	%(percentage of subjects)
1-10 years	3	1.50
10-20 years	21	10.50
20-30 years	71	35.50
30-40 years	69	34.50
40-50 years	30	15.00
50-60 years	4	2.00
60-70 years	2	1.00
Sex		
Male	108	54.00
Female	92	46.00
CD4 cell count status		
>500cells/mm^3	16	8.00
200-500cells/mm^3	58	29.00
<200cells/mm^3	126	63.00
Risk groups		
H+CSW*	117	58.50
Bisexual*	1	0.50
IDU*	1	0.50
H*	29	14.50
H+MP*	48	24.00
Bi+MP*	1	0.50
Unknown	3	1.50

H+CSW heterosexuals visiting commercial sexual workers. IDU* intravenous drug users. H* heterosexual. H+MP* heterosexuals with multiple partners. Bi+MP* bisexual with multiple partners.*

Table 2: Prevalence of oral lesions in 200 HIV infected subjects

Oral lesions	No of subjects	%(Percentage)
Periodontally healthy	38	19.00
Oral candidiasis	48	24.00
Oral ulceration	39	19.50
HSV infections*	7	3.50
LGE*	18	9
NUG*	7	3.5
Others	43	21.5

HSV herpes simplex viral infection. LGE* linear gingival erythema. NUG* necrotizing ulcerative gingivitis*

Table 3: Distribution of study subjects according to CD4 cell count and specific form of periodontal disease

Specific form of periodontal disease	CD4>500	CD4 200-500	CD4<200	Total
Normal	16 (9%)	53 (30%)	106 (60%)	175
LGE*	0	3 (16%)	15 (83%)	18
NUG*	0	2 (28%)	5 (71%)	7
Total	16 (8%)	58 (29%)	126 (63%)	200

Chi-square=3.8487, p=0.1459, NS
LGE linear gingival erythema. NUG* necrotizing ulcerative gingivitis.*

Table 4: Distribution of study subjects according to age and specific form of periodontal disease

Age	Normal	LGE*	NUG*	Total
1-10 years	3 (100%)	0	0	3
10-20 years	16 (76%)	3 (14%)	2 (9%)	21
20-30 years	63 (89%)	5 (7%)	3 (4%)	71
30-40 years	61 (88%)	7 (11%)	1 (1%)	69
40-50 years	27 (90%)	3 (10%)	0	30
50-60 years	3 (75%)	0	1 (25%)	4
60-70 years	2 (100%)	0	0	2
Total	175	18	7	200

Chi-square=12.0270, p=0.44356, NS

Among eighteen patients with LGE majority were females. In seven patients with NUG, four (57%) were male and three were females. No statistical significance was noted between gender and specific form of periodontal disease (chi square=1.8260, p=0.04012) (Table-5)

Table 5: Distribution of study subjects according to gender and specific form of periodontal disease

Specific form of periodontal disease	Normal	LGE*	NUG*	Total
Male	97 (55%)	7 (38%)	4 (57%)	108
Female	78 (44%)	11 (61%)	3 (42%)	92
Total	175	18	7	200

Chi-square=1.8260, p=0.040127, NS
LGE linear gingival erythema. NUG* necrotizing ulcerative gingivitis.*

Out of seven NUG patients, five (4.27%) were heterosexuals visiting commercial sex workers and two were heterosexuals with multiple partners. No statistical significance was noted between the risk group and specific form of periodontal disease (Table-6)

Table 6: Distribution of study subjects according to risk groups and specific form of periodontal disease

Risk groups	Normal	LGE*	NUG*	Total
H+CSW*	98 (83%)	14 (12%)	5 (4.27%)	117
Bisexual*	1 (100%)	0	0	1
IDU*	1 (100%)	0	0	1
H*	28 (96%)	1(3%)	0	29
H+MP*	43(89%)	3 (6%)	2 (4.17%)	48
Bi+MP*	1(100%)	0	0	1
Unknown	3(100%)	0	0	3
Total	175 (87%)	18(9%)	7 (3.5%)	200

Chi-square=11.0270, p=0.4436, NS
H+CSW heterosexuals visiting commercial sexual workers. IDU* intravenous drug users. H* heterosexual. H+MP* heterosexuals with multiple partners. Bi+MP* bisexual with multiple partners. LGE* linear gingival erythema. NUG* necrotizing ulcerative gingivitis.*

DISCUSSION

Among 200 HIV/AIDS patients, the clinical range of the oral manifestations of HIV infection seen in our study is similar to that reported elsewhere in Asian countries by Ranganathan (2000) and Nittayananta (1997). In the present study no patient with oral hairy leukoplakia and kaposis sarcoma was found. This is consistent with the low prevalence reports from Asian countries. The reasons suggested for the absence of

oral hairy leukoplakia and kaposis sarcoma is that Epstein bar virus (EBV) infection is more common in homosexual transmission which causes OHL and kaposis sarcoma. Only one homosexual is found in our study, hence this mode of transmission is very low. Secondly the EBV infection may be associated with a sub-type of HIV different from that occurring in the Asian countries. The relatively low incidence of Kaposi's sarcoma (KS) and Oral hairy leucoplakia in Asia compared to the western countries is consistent with other reports by (Anil *et al.,* 1997).

Twenty five (12.5%) individuals with specific form of periodontal diseases were reported in our study. This is in agreement with *(*Laskaris *et al.,* 1992) however the prevalence rates vary in the range of 5% to 80%. No statistical significance was noted between the specific form of periodontal disease associated and immune suppression as categorized by (CDC) centre for disease control. The present finding of our study is in agreement with (Barr *et al.,* 1992) who had shown specific form of periodontal disease(HIV associated) are not related to immunosuppression which can be attributed to the who had CD4 cell counts above 400 cells/mm^3 as well as below 400 cells/mm^3.

We found highest number of HIV individuals that is one hundred forty (70%) in the age group of 20-40 years. This finding is consistent with other South Indian studies by (Sharma *et al.,* 2006 and Kerdpon *et al.,* 2006). One of the reasons for the above finding may be that patients in the age range of 21-40 years are considered as the predominantly working group and also they may be sexually more active .Fifteen (83%) patients with LGE and six (85%) with NUG were found in patients belonged to age group of 20-40 years. As this age group included more number of HIV patients, it is logical to assume that due to immunodeficiency state these patients are more prone for increased prevalence and severity of specific form of periodontal disease like any other systemic infections. The insignificant association of these specific forms of periodontal disease and age is in agreement with (Eyeson *et al.,* 2002).

It was observed that males (54%) dominated in the number of HIV patients and when compared to that of females (46%). The results are in agreement with (*Giuseppina et al*., 2001 and Ramirez *et al.,* 1990). In the present study no statistical significant differences were observed in regard to specific form of periodontal diseases and gender. So far this finding has not been investigated in many studies; a study on a larger sample needs to be carried out to corroborate this finding.

In the South India's heterosexually transmitted HIV epidemic, men first acquire HIV from commercial sex workers and then pass the virus to their wives. In the present study heterosexual visiting commercial sex workers have shown predominant prevalence of specific form of periodontal disease that is nineteen (16%) patients and followed by five (10.5%) heterosexual patients who had multiple partners. The present finding is in agreement with (Umadevi *et al.,* 2007). However further studies are necessary to understand these associations. Necrotizing ulcerative periodontitis (NUP) was not found in any of the case in the present study. NUP is significantly more common among homosexuals, irrespective of racial background, than among any other HIV transmission category. Taking the above findings into consideration, one of the reasons for the absence NUP in our study may be because of the very low occurrence of homosexuals (only one case). The male preponderance in our study group was due to promiscuous heterosexual behavior rather than homosexual practices.

Conclusion

In Asian country like India the appearance of oral manifestations are different compared to those seen in European countries? Since the practitioners and health professionals can anticipate to look the oral candidiasis,hyperpigmemtation,linear gingival erythema and necrotizing ulcerative gingivitis in our set of practice in southern India. Since we found poor association between particular age,sex,sexual behavior, CD4 cell count and specific form of periodontal disease, these periodontal disease can be seen in any HIV infected patient irrespective of particular age, male or female, heterosexual or homosexual and with any immune status. So each HIV individual should be evaluated carefully for the presence of oral manifestations of HIV infection which often alerts as early alarm of HIV infection contributing towards early detection and management of HIV infection.

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