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Oral Candida Infection and Colonization in Human Immunodeficiency Virus-Positive Individuals

Medical Science

KEYWORDS : Candida albicans , Human immunodeficiency virus, Oral carriage.

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ABSTRACT

Background: Oropharyngeal Candida infections are the most common opportunistic diseases in human immunodeficiency virus (HIV) infected individuals, occurring in up to 90% of patients during the course of their disease. Aims and Objectives: To know the prevalence of oral candidiasis and oral carriage in HIV seropositive patients and to isolate and identify the candidal species in the oral cavity. Materials and Methods: A total 150 HIV seropositive and 50 HIV seronegative patients were studied, 4 swab were taken, 2 for smear preparation and 2 for culture. Routine mycological tests for the isolation and identification of cultures of Candida were done. Results: Incidence of oral carriage of candida in HIV seropositive was 22%. Candida albicans(84.85%) was the common isolate, followed by C.tropicalis, C.glabrata and C.krusei. Conclusion: Oral colonization of candida species were higher in HIV seropositive patients, and may develop oral candidiasis depending on their immune status, medical condition, or antibiotic usage.

INTRODUCTION:

AIDS(Acquired immunodeficiency syndrome),The modern pandemic is fatal disease caused by retrovirus – Human immunodeficiency virus (HIV) 1&2(1). Disease usually progresses faster and the outcome is more serious, resulting in a high mortality rate due to serious opportunistic infections(OIs)(2). Oral candidiasis is one of the most common opportunistic infections in HIV/AIDS. In HIV-positive patients, both colonisation and disease in oral cavity and other mucosal surfaces is common(3). HIV-induced alterations as decreased salivary IgA levels, impairment of mucosal CD4 cells, altered cytokine secretion and a shift to Th2 cytokine expression in saliva likely contribute to Candida colonisation and disease(4). Higher prevalence of oral *C. albicans* colonization may be a predisposing factor for the subsequent development of clinical thrush. Studies have shown that 90% of patients with HIV will have at least one oral manifestations during the course of disease(5,6). C. albicans is the most common clinical isolate, originally with good antifungal susceptibility(7). But with the emergence of other species of Candida as pathogens and a development of change in the susceptibility pattern of the C. albicans, as well as the newer species of Candida, it is necessitating the isolation and identification of the causative species(8). Aim of our study was to know the prevalence of oral candidiasis and oral carriage in HIV seropositive patients, and to isolate and identify the Candidal species prevalent in the oral cavity.

Material & Method:

Study Groups: A total 200 Patients were studied at Guru Gobindsinh Hospital Jamnagar.

Group 1: HIV seropositive Patients with sign and symptom of oral infection.

Group 2: HIV seropositive Patients without sign and symptom of oral infection without oral symptom.

Control Group: Normal healthy HIV seronegative patients.

Specimen collection: After proper mouth wash swab were collected from the mucosal lining of cheek and lingual mucosa. A total 4 swab were collected, 2 for smear preparation and 2 for culture inoculation. Smear was stained by gram staining method, and observed for gram positive budding yeast cells or pseudohyphae. After direct smear examination all swabs were inoculated on Sabourauds dextrose agar and incubated at 25˚C and 37˚C. The culture media were periodically examined at for growth of yeast.

Identification: Then yeast growth were examined for the colony morphology, chlamydospore formation on corn meal tween 80 agar, germ tube test, sugar fermentation and sugar assimilation and urease test for species identification.

RESULTS:

A total of 150(105 male,45 female) HIV seropositive and 50 HIV seronegative patients were investigated. No. of cases of oral candidiasis and carriage were found to be higher in middle age group i.e.21-30yrs and number of male patients(70%) found to be higher than female(30%). Out of 150 HIV seropositive, 70 were with oral symptom(group-1) and 80 were without oral symptom(group-2). Incidence of oral candidiasis in symptomatic patients was 92.86%, Incidence of oral carriage in asymptomatic HIV seropositive was 41.25% and 12% in healthy normal individual(control group).(Table 1)

Table-1 Isolation of candida from total cases.

Group	Total No. of patients	Culture positive patients
Group-1	70	65(92.86%)
Group-2	80	33(41.25%)
Control group	50	06(12%)
Total	200	104

Out of 65cases of oral candidiasis and 33 cases of oral carriage, 56(86.15%) and 28(84.85%) were germ tube positive that is Candida albicans and 9 cases(13.85%) of oral candidiasis and 5 cases(15.15%) of oral carriage were germ tube negative that is non albicans species. Among all candida species Candida albicans found to be highest 86.15% and 84.85% in both groups followed by Candida tropicalis, Candida glabrata and Candida krusei. In control group all the isolates were Candida albicans. (Table 2)

Table-2 Incidence of different species of candida from positive isolates.

Candida species	Cases of Oral Candidiasis No.(%)	Cases of Oral carriage cases No.(%)	Control Group No.(%)
Candida albicans	56(86.15%)	28(84.85%)	6(100%)
Candida tropicalis	5(7.69%)	3(9.10%)	0(0%)
Candida glabrata	3(4.62%)	2(6.05%)	0(0%)
Candida krusei	1(1.54%)	0(0%)	0(0%)
Total	65(100%)	33(100%)	6(100%)

Out of all cases of candidiasis, 37(56.92%) addicted with gutka followed by 29(44.62%) addicted with bidi or cigarette form of smoking. Amongest cases of oral carriage, 14(42.42%) patients addicted with gutka, whereas 10(30.30%) patients addicted with Bidi or cigarette form of smoking.(Table -3)

Table-3 Addiction amongst HIV seropositive cases(multiple resposnse)

Addiction	HIV positive patients(n = 150)	Cases of Oral Candidiasis No.(%)	Cases of Oral carriage cases No.(%)
Gutka	78(52%)	37(56.92%)	14(42.42%)
Smoking	63(42%)	29(44.62%)	10(30.30%)

Alcohol	40(26.67%)	14(21.54%)	3(9.10%)
Bajjor	6(4%)	2(3.08%)	1(3.03%)
No addiction	40(26.67%)	7(10.76%)	5(15.15%)

DISCUSSION:

The presence of Candida albicans in the oral cavity is not indicative of disease. In many individuals, C. albicans is a minor component of their oral flora, and they have no clinical symptoms. It is difficult to give a precise oral carriage rate for C.albicans, since this depends on the age and health of the population studied. In our study incidence of carriage in healthy person was 12%. A compilation of data from a number of reports showed that the mean carriage rate for healthy individuals (no known underlying disease) was 17.7% (Range 1.9-62.3%)(9). Cohen *et al*(10) reported the prevalence of Yeast as 35% in oropharynx in healthy volunteers. Hanan *et al*(11) in their study reported an incidence of 30–45% of oral candidiasis in healthy adults. These data indicate that the health of an individual is a predisposing factor for C.albicans colonization.

In human immunodeficiency virus (HIV+) patients, nonspecific oral immunity is reduced, contributing to the frequent appearance of candidiasis(12,13). In present study incidence of oral candidiasis in total no. of HIV seropositive 43.33%. which was similar to study of lalith Prakash Chandra et al(42%)(14).In present study majority of the isolates obtained were *C. albicans* (86.15%), non albicans species were identified in 13.85% in candidiasis. Costa et al.(15) also reported that Candida albicans presented the highest frequency (50%) whereas non-C. albicans species were represented by C. tropicalis (20.9%), C. parapsilosis (19.3%), C. guilliermondii (4.8%), C. lusitaniae (1.6%), C. krusei (1.6%), and C.kefyr (1.6%) were present. Mrudula Patel *et al*, reported 78.6% of *C. albicans* as the most common species isolated and 21.4% of nonalbicans species(16).

Asymptomatic oral carriage of *C. albicans* is a common finding in HIV-infected patients (17). Asymptomatic oral carriage of *C. albicans* was found (22%). lalith Prakash Chandra, Carolina Rodrigues reported 38%, 62.6%(14,18). Costa et al.(15) found that out of 99 HIV-positive patients studied, 62 (62.6%) had positive culture for Candida (oral carriage). FONG et al. have demonstrated that persistent asymptomatic carriage of Candida species is a possible risk factor for subsequent oral infection(19). Studies have shown that symptom-free HIV-positive patients with CD4+-lymphocyte counts of less than 400 cells/µl have a 50% risk of progression to full-blown AIDS within 3 years. However, such patients who also have thrush have a 90% risk of progression in the same period (20).

Half of the cases of oral candidiasis and carriage were habituated to tobacco and smoking in present study. Some studies have suggested that smoking does not affect Candida carriage significantly (21), while others have reported that smoking significantly increased carriage by 30 to 70%. It has been suggested that cigarette smoking might lead to localized epithelial alterations that allow colonization by Candida (22).

CONCLUSION:

Oral candidiasis is the most common opportunistic infection in HIV infected individual and may occur as the first clinical sign or symptom of HIV disease. Out of all Candida spp. C.albicans was detected with high frequency in HIV-infected patients. The isolation rate of candida in HIV seropositive patients without symptom was higher than the HIV seronegative patients. Higher prevalence of oral candida colonization may exhibit oral candidiasis depending on their immune status, medical condition or antibiotic usage. Nearly all patients who progress to clinical AIDS have oral candidiasis at some times.

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