

Original Research Article

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## Prevalence of Oral Candida Carriage Rate among HIV Infected Asymptomatic and Non Infected Persons, their Antimycotic Sensitivity and its Association with CD4 Counts

Smita Kulshreshtha<sup>1\*</sup>, Usha Verma<sup>1</sup>, P.K. Khatri<sup>1</sup> and Prameshwar Lal<sup>2</sup>

<sup>1</sup>Department of Microbiology, Dr. S. N. Medical College, Jodhpur, Rajasthan, India

<sup>2</sup>C.H.C. Lohawat, Jodhpur, Rajasthan 342003, India

\*Corresponding author

### ABSTRACT

Oral carriage of Candida species is common in HIV infected patients. Oral sputum was taken from study group of 75 patients and control group of 26 patients. Samples were cultured on 1% G.A. sabouraud dextrose agar to isolate candida species. Out of total 75 HIV positive asymptomatic patients, Male : Female ratio was 4:1.7. Candida species *C.albicans*, *C.tropicalis*, *C. pseudotropicalis*, *C.krusei*, *C.glabrata*, *C.parapsilosis*, *C.guilliermondii* were identified. Oral candida carriage rate among study group were 65.33% where as in control group it was 42.31%. In study group *C.albicans* was 69.39% followed by other non albicans species. In control group also *C.albicans* was the predominant species (36.36%) followed by other non albicans species. In study group sensitivity of *C. albicans* to nystatin was 97.06% followed by amphotericin-B 91.17%, clotrimazole 88.24%, fluconazole 82.36%, ketoconazole 76.47%, and itraconazole 73.53%. Sensitivity of control group to nystatin was 100% followed by amphotericin-B 100%, clotrimazole 75%, fluconazole 50%, ketoconazole 25%, and resistant to itraconazole. Out of study group 38 patients had CD4+ cell count 200-499 Cells/ $\mu$ L, of whom 26 were oral Candida carrier. There were significant fungal associations with gender, age and antiretroviral therapy ( $P \leq 0.05$ ).

### Keywords

Candida, HIV, CD4, Oropharyngeal Candidiasis, Oral candida carriage, Fluconazole, ART.

### Article Info

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### Introduction

HIV causes AIDS by depleting CD4<sup>+</sup> T cells. This weakens the immune system and allow opportunistic infections (Hel *et al.*, 2006). Oropharyngeal candidiasis, often the first sign of HIV infection, is the most prevalent fungal opportunistic infection in HIV infected individuals (Barr, 1992). Numerous oral manifestations have been described for HIV-infected patients and the

most common are those resulting from fungal infections, specific & nonspecific bacterial infections, viral infections & neoplasms, and those of unknown etiology (Moreira *et al.*, 2002).

The main aim and objectives of this study, to ascertain the prevalence of candida species in asymptomatic HIV seropositive patients & correlation in CD4 counts and

candida carriage in Western Rajasthan and to compare the presence of candida species in HIV seropositive & HIV seronegative asymptomatic oral candida carriers and to ascertain antimycotic sensitivity.

### **Methodology**

The present study is conducted in M. G. Hospital, Microbiology lab, associated with Dr. S. N. Medical college, Jodhpur, Rajasthan. First morning oral sputum was taken from study and control group. All the clinical samples were collected from ART patients of K N Chest hospital associated with Dr. S.N.M.C. Jodhpur. Study carried out from Sept. to Dec. 2015.

### **Materials and Methods**

All the samples were inoculated over Sabouraud's dextrose agar, kept at 25°C-28°C in B.O.D. incubator and examined after 24 to 48 hours for the appearance of any fungal colonies which were whitish and opaque were subjected to follow up. Direct smear for Gram staining and 10% KOH for fungal hyphae or spores and Lactophenol cotton blue mount. Candida species were identified by germ tube test, characteristics morphology on Glucose agar-0.1%, culture characteristics on HI chrome agar (HI media, Mumbai, India) & confirmed by Automated Vitek 2 system.

### **Antifungal Susceptibility**

The antifungal susceptibility testing of the yeast isolates was tested by Disc diffusion method as per CLSI M44-A2 document-recommendation using Mueller Hinton Agar media supplemented with 2% glucose & 0.5 µg/ml methylene blue dye to bring contrast. All yeast isolates were tested against Amphotericin B (100 U), nystatin (100 U), fluconazole (10µg), itraconazole (10 µg) and clotrimazole (10µg), and ketoconazole (10

µg) (*Candida krusei* was not tested for fluconazole because of intrinsic resistance).

### **Observations**

In our study a total of 75 study participants in two groups were investigated for oral Candida carriage with age range of 18-75 years old. It comprised M: F were 4:1 whereas in control group M: F were 1: 1. The oral Candida carriage rate was 65.3% in HIV infected individuals and 42.3% in healthy participants.

Among study group (n=75) 20 patients were on ART therapy. Out of which 45% were candida carrier as compare 55 patients not on ART therapy in which candida carrier rate was 72.7%.

Out of the study group, 17 patients had CD4+ count less than 200 Cells/µL, of whom 8(47.06 %) were oral Candida carrier, 38 patients had CD4+count 200-499 Cells/µL, of whom 26(68.42 %) were oral Candida carrier, 20 patients had CD4+ count greater or equal to 500 Cells/µL of whom 15(75 %) were oral Candida carrier. In control group all patients had CD4+ count in normal range.

Oral candida carriage rate among study group were 65.33% where as in control group it was 42.31%. In study group *Candida albicans* (69.39%) was the most common species isolated whereas 30.61% were non albicans species and in control group *C.albicans* was 36.36% whereas non albicans species were 63.63% which is also similar to Arati Mane *et al.* where *C.albicans* was (80.9%) commonest species whereas 19.1% were non albicans species in HIV positive asymptomatic patients (Arati Mane *et al.*, 2010). The studies revealed that polyene group (nystatin and amphotericin-B) of are highly sensitive as compared to azole group (fluconazole, clotrimazole,

itraconazole, ketoconazole) of antimycotic drugs in both study and control group. It is almost similar to Arati Mane *et al.*, in which

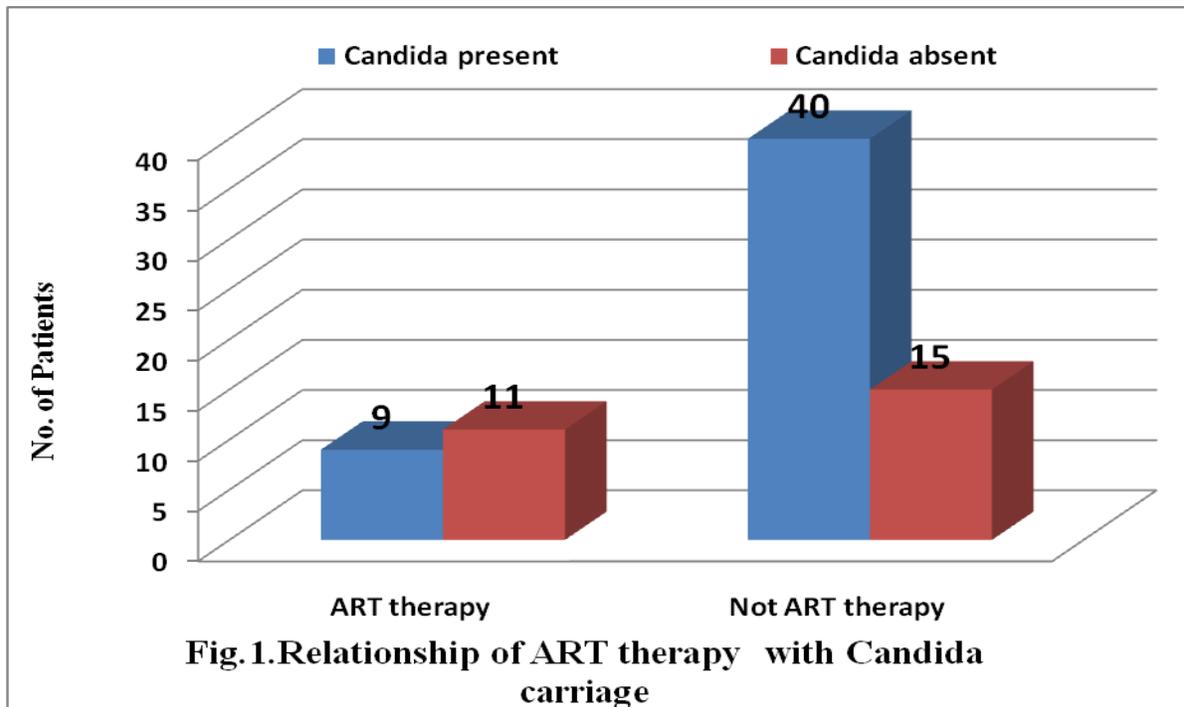
overall 14 % of *Candida* species were resistant to at least one of the three azoles tested.

**Table.1** Antifungal sensitivity pattern in study and control group

<i>Candida</i>	Study group							Control group						
	Total isolates	AP (%)	NS (%)	CC (%)	FLC (%)	IT (%)	KT (%)	Total isolates	AP (%)	NS (%)	CC (%)	FLC (%)	IT (%)	KT (%)
<i>C.albicans</i>	34	31	33	30	28	25	26	4	4	4	3	2	0	1
<i>C.tropicalis</i>	4	3	4	2	2	1	2	2	2	2	1	0	0	1
<i>C.pseudotropicalis</i>	3	3	3	3	3	3	3	1	1	1	1	1	0	0
<i>C.krusei</i>	3	3	3	3	-	1	2	1	1	1	1	-	0	0
<i>C.glabrata</i>	2	2	2	2	1	0	1	1	1	1	0	0	0	0
<i>C.parapsilosis</i>	2	2	2	2	2	0	1	1	1	1	0	0	0	0
<i>C.guilliermondii</i>	1	1	1	1	1	0	1	1	1	1	1	0	0	0

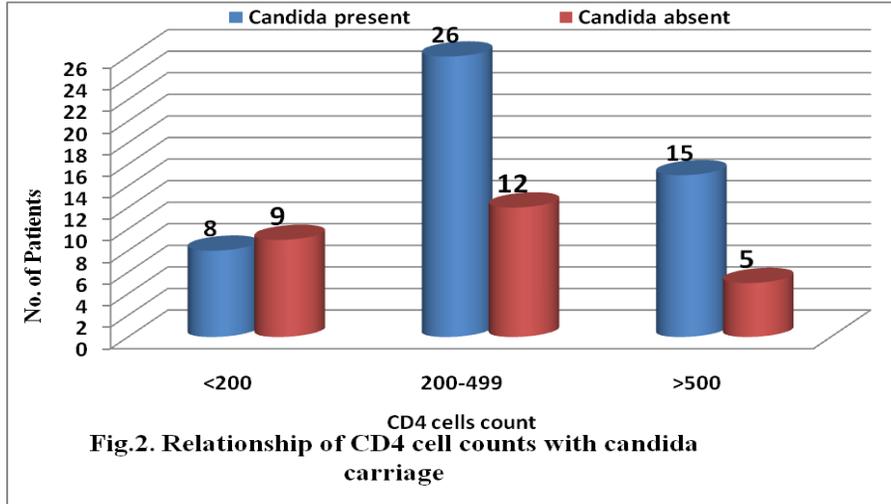
AP-AmphotericinB, NS-Nystatin, CC-Clotrimazole, FLC-Fluconazole, IT-Itraconazole, KT-ketoconazole,

**Fig.1**



**Fig.1.**Relationship of ART therapy with Candida carriage

Fig.2



There is significant correlation with ART therapy and candida carriage. The carriage rate of non ART users was greater than among ART users (p value = 0.031). On comparison of various groups of CD4+ count there was no significant correlation found between oral carriage and CD4+ count (P >0.05). It was not similar to Arati Mane *et al.* where statistically significant association found between oral candidiasis and low CD4 counts, (P<0.001).<sup>4</sup>

In conclusion, the Oral candida carriage rate and *C.albicans* is more common in HIV positive as compare to HIV negative patients. It is also more common in HIV positive who do not have access to ART therapy. However no significant correlation found between oral carriage and CD4+ count. Candida species are more sensitive to polyene group than azole group of

antimycotic drugs.

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