

Original Research Article

Prevalence of Candida infection in HIV seropositive patients in Karur district of Tamil Nadu, India

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ABSTRACT

Keywords

Oral candidiasis, HIV, Candida species, sputum samples

Oral candidiasis is commonly associated with HIV infection. Candida species are normal commensal of the oral microbial flora and get established there during or soon after birth. During the past two decades, there has been a significant increase in the prevalence of fungal infections caused by Candida species. The yeast Candida being the main cause of candidiasis is commonly isolated pathogen from immunocompromised patients. The aim of the study was to isolate and identify Candida species from the sputum samples of HIV positive patients. Sputum samples were collected from 20 HIV positive patients and inoculated on Candida differential medium for isolation. After appearance of the colonies on Candida medium, individual colony is inoculated on the Hichrome agar plate for the identification of different species of Candida on the basis of colour. Out of the twenty sputum samples, *Candida tropicalis* account for 42%, followed by *Candida krusei* 33 % and *Candida albicans* 25%. Among the three Candida species, *Candida tropicalis* is the leading cause of oropharyngeal candidiasis in HIV infected persons with in the study population.

Introduction

Candida is a polymorphic fungus. It is a Gram positive, oral, budding yeast cell that produces pseudohyphae both in culture and in tissues and exudates (Chakrabarthy and Shivaprakash, 2005). They exhibit filamentous mycelial yeast morphology in the parasitic phase, in tissues and when grown at 37 °C in the laboratory (Chakrabarthy and Shivaprakash, 2005). They form pseudohyphae when the buds continue to

grow but fail to detach, producing chains of elongated cells that are pinched or constricted at the septation between cells (Calderone and Fronzi, 2001). There are about 68 species of *Candida*; the most pathogenic is *Candida albicans* (Soll, 2002). The other non – albicans *Candida* (NAC) species include *C.dubliensis*, *C. glabrata*, *C. guilliermondii*, *C.keyfr*, *C. lipolytic* and *C. pelliculos* (Khan, *et al.*, 2004; Diaz – Fuentes, *et al.*, 2007).

C.albicans is most commonly found in thrush. Oral thrush is a superficial of the mucous membrane characterized by white adherent patches of pseudo mycelium which frequently involves lesions, sores, fissures and ulcers in the mouth which could either be acute or chronic (Elias Anaissie, *et al.*, 1991). Reduced saliva secretion, deficiencies of humoral or cell mediated immunity, local mucosal diseases and use of wide spectrum antibiotics are predisposing factors of Oral candidiasis (Odds and Bernearts, 1994) and its prevalence in various countries varies among studies according to location, age of the patients and the site sample, and has been reported to range from 20- 75% (Daniluk, *et al.*, 2006). The spectrum of *Candida* infection is diverse, starting from asymptomatic colonization to pathogenic forms. The low absolute CD4⁺ T- lymphocyte count has traditionally been cited as the greatest risk factor for the development of oropharyngeal candidiasis and current guidelines suggest increased risk once CD4⁺ T- lymphocyte counts fall below 200 cells/ μ (Khan, *et al.*, 2012). The present study is to evaluate the prevalence of *Candida* species in the oral cavity of HIV positive patients in Karur district of Tamilnadu.

Materials and Methods

Sample collection

Twenty sputum samples were obtained from the oral cavities of Hospitalized HIV /AIDS patients of Karur District of Tamil Nadu and patients who have come for Treatment at ART Centre of Karur Government Hospital. All the samples were collected taking all aseptic precautions. Samples were inoculated on *Candida* differential medium for isolation.

After appearance of the colonies on *Candida* medium, individual colony is inoculated on the Hichrome agar plate for the identification of different species of *Candida* on the basis of morphology and colour.

Results and Discussion

A total of 20 sputum samples were collected from the HIV positive patients of Karur district. Out of twenty sputum samples, *Candida* species were isolated from 8 samples (40%). The majority of *Candida* species amongst the *Candida* isolates were *Candida tropicalis* followed by *C. krusei* and *C.albicans* (Table-4). The youngest patient from whom *Candida* species was isolated from sputum was 30 years old and the oldest patient was 40 years old. The highest rate of isolation of *Candida* was between the ages of 31-40 (Figure-3; Table-3). *Candida* was isolated from four male and four female patients. According to the results obtained *Candida tropicalis* was the most frequently isolated with 42%, this was followed by *C.krusei* (33%) and *C. albicans* (25%) (Figure- 4) Germain, *et al.*, 1998, found the distribution of *Candida* species to be as follows; *C. albicans* (54%), *C. glabrata* (15%), *C.parapsilosis* (12%), *C. tropicalis* (9%) and *C.krusei* (31%). The findings of the present study are similar with the result of Binesh and Kalyani, 2011 who reported that *C. tropicalis* was the predominant species 69(54.3%), followed by *C.albicans* 48 (37.8%), 7(5.5%) isolates were *C.parapsilosis* and 3(2.4%) isolates were *C. glabrata*. Arunaloke Chakrabarthy, *et al* in their study observed that *C.tropicalis* was the commonest agent (42%) isolated followed by *C. guilliermondii* (15%) and *C. krusei* (10%) (Arunaloke Chakrabarthy, *et al.*, 1999). Another study by the same author reveals that *Candida non albicans* were predominant and *C.tropicalis* was the

Table.1 Growth of *Candida* species on CHROM agar

| Organism | Hichrome agar medium |
|---------------------------|---|
| <i>Candida albicans</i> | Light green colour colonies |
| <i>Candida tropicalis</i> | Bluish green colour colonies |
| <i>Candida krusei</i> | large, spreading pink colonies with matt surface; |

Figure.1 Growth of *Candida* species on HI-CHROME agar

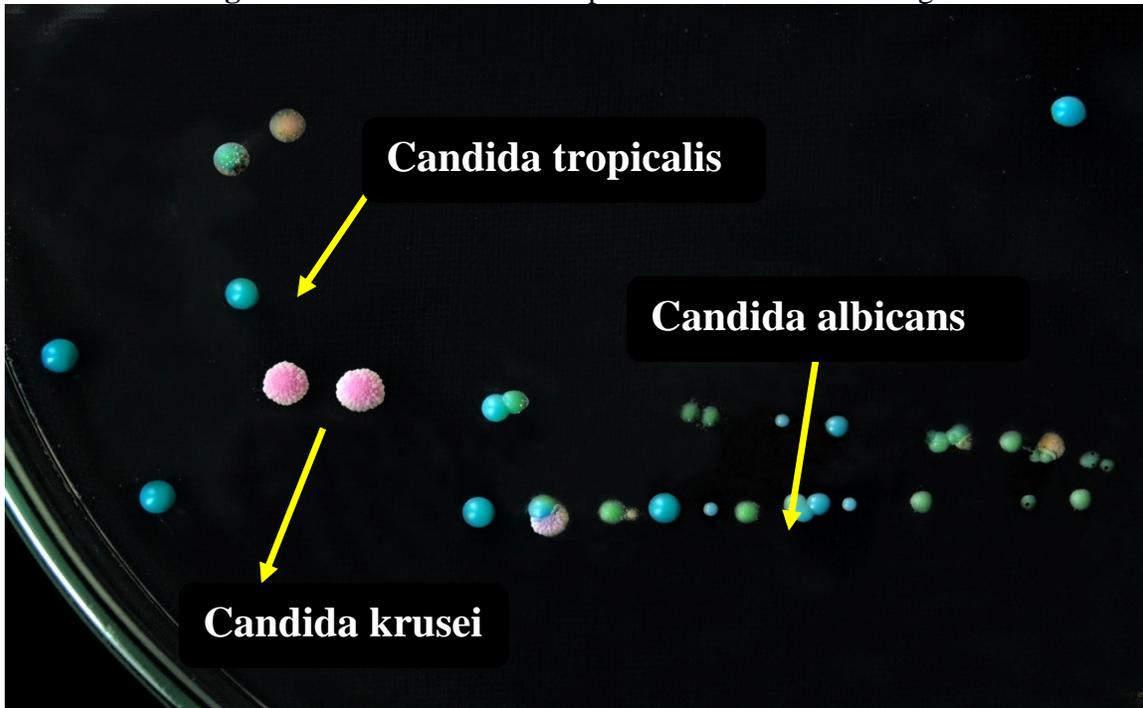
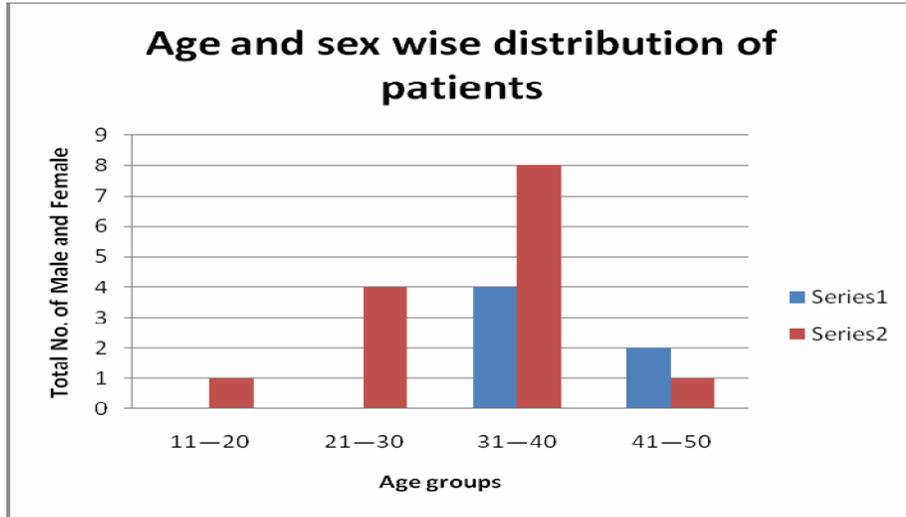


Table.2 Age and Sex wise distribution patients, n = 20

| Age | Male | Female | Total (%) |
|--------------|----------|-----------|------------------|
| 11-20 | 0 | 1 | 1 (5%) |
| 21-30 | 0 | 4 | 4 (20%) |
| 31-40 | 4 | 8 | 12 (60%) |
| 41-50 | 2 | 1 | 3 (15%) |
| Total | 6 | 14 | 20 (100%) |

Figure.2 Age and sex wise distribution of patients



Series 1- Male; Series 2- Female

Table.3 Age and gender distribution of *Candida* species among HIV patients

| Age (years) | Number of isolates | Percentage of isolates |
|-------------|--------------------|------------------------|
| 11-20 | 0 | 0 |
| 21-30 | 2 | 17 |
| 31-40 | 10 | 83 |
| 41-50 | 0 | 0 |

Figure.3 Age and gender distribution of *Candida* species among patients

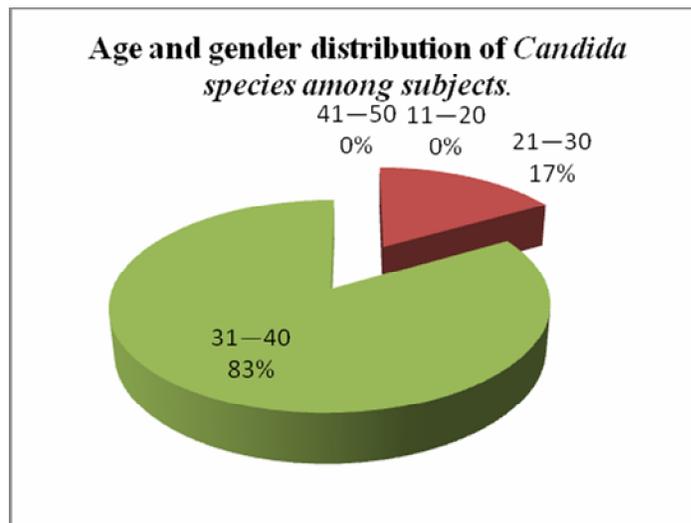
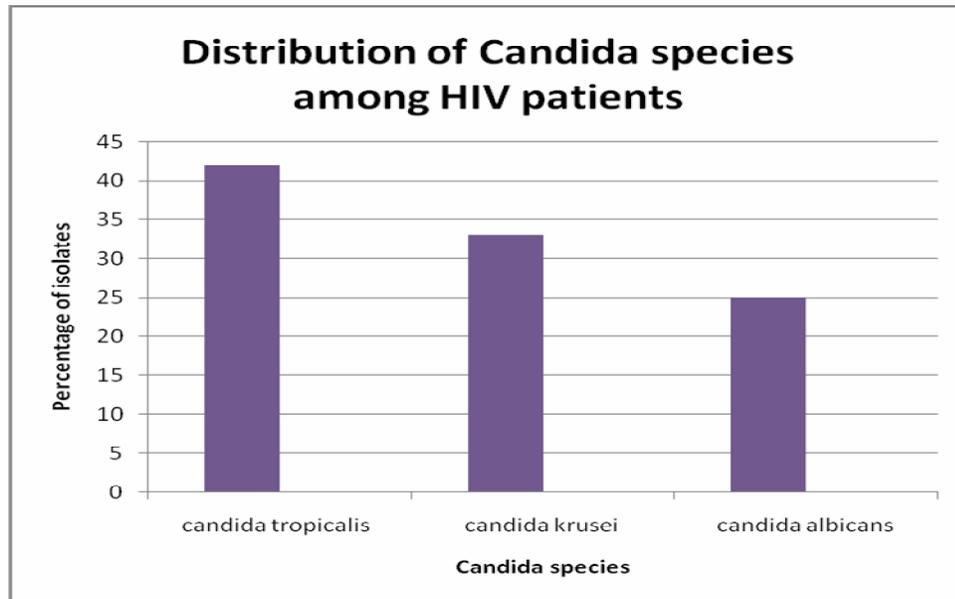


Table.4 Distribution of *Candida* species among HIV seropositive patients

| Candida species | Number of isolates | Number of isolates % |
|---------------------------|---------------------------|-----------------------------|
| <i>Candida tropicalis</i> | 5 | 42 |
| <i>Candida krusei</i> | 4 | 33 |
| <i>Candida albicans</i> | 3 | 25 |

Figure.4 Distribution of *Candida* species among HIV patients



commonest (36.1%) among them (Arunaloke Chakrabarthi, *et al.*, 2002). The present results were mismatched with the findings of work done by Jha, *et al.*, 2006; Okonkwo, *et al.*, 2013. Present study suggest that routine checks for opportunistic infections including oral candidiasis are important and should be carried out at intervals to help monitor disease progression and also prevent subsequent complications such as candidemia. Identifying *Candida* to its species level is important because it helps guiding proper treatment.

Acknowledgement

Dr.T.Francis Xavier wish to thank the Science and Engineering Research Board (SERB), Department of Science and

Technology, New Delhi, India (No.SB/FT/LS-141-2012) for their financial support in the form of Young Scientist Grant (Fast Track Scheme) and also thank Rev.Dr.S.John Britto, Rector, Rev.Dr.S.Sebastian, Secretary, Rev.Dr.F.Andrew, Principal of St,Joseph's College, Trichy for providing infrastructure to carry out this research work. The authors also thank Mr. Visvanathan, President, and the members of Karur district network for positive people, Karur district, Tamil Nadu for providing oral and sputum samples for this study.

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