

Original Research Article

<https://doi.org/10.20546/ijcmas.2018.708.394>

Phenotypic Characterisation of *Candida* Species from Clinical Isolates in a Tertiary Care Teaching Hospital Hyderabad, India

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ABSTRACT

Background- Recently fungal infections are increased rapidly due to increase antibiotic use and misuse along with increased use of intravascular devices. Especially colonizing yeast like organisms like *Candida* species are emerging as important fungal pathogen. Aim- Thus this present study focused on isolation and characterisation of *Candida species* from various clinical isolates. Materials and methods- the present study was conducted in Department of Microbiology, ESI Medical College and Hospital from April 2017 to May 2018. Various clinical specimens included such as, urine, sputum, high vaginal swab, nail, skin and blood. A total of 1,650 specimens were included in this study. Identification and speciation of *Candida* isolates were done as per the standard Microbiological procedures. Results- Most of the *Candida species* was isolated from male patients (62.3%) and 37.73% were female patients. Most common age group affected by candidiasis was 21-40 years (28/52.8%) followed by 41-50 years (14/25.9%). Among all these specimens, urine culture yielded more number of *Candida* isolates (27/50%) followed by sputum (14/25.9%), high vaginal swab (6/11.1%), nail (3/5.5%), skin (2/3.7%) and blood (2/3.7%). Out of 54 isolates, one was *Cryptococcus spp* and rest of the isolates were *Candida spp*. Among 53 *Candida species*, 32 were isolated as *Candida albicans* (60.4%), 8 were *Candida tropicalis* (15.09%), 6 were *Candida krusei* (11.3%) and 4 were *Candida glabrata* (7.5%) and 3 were *Candida parapsilosis* (5.7%). Conclusion- Identification and characterisation has to be done for all *Candida* isolates along with clinical correlation.

Keywords

Candidiasis, phenotypic characterisation, *Candida species*

Article Info

Accepted:

20 July 2018

Available Online:

10 August 2018

Introduction

Candidiasis is the most common fungal disease affecting skin, nails, mucosa and internal organs in human. It is caused by yeast

like fungi *Candida*. It has wide clinical spectrum from acute to chronic and superficial to deep infection (Pfaller *et al.*, 2006; Falagas, 2010; Jones, 1990). It is rarely found as primary infectious agent and mainly causes

secondary infection in immunocompromised individuals. Multiple factors such as, diabetes mellitus, cancer, excessive use of antibiotics, increased use of intravascular devices can increase the risk of candidemia. Diversity and clinical spectrum among *Candida* species is wide (Prasad *et al.*, 1999; John *et al.*, 2001).

Therefore identification and speciation of *Candida* species is most important in clinical case management. Hence, the present study was aimed to isolate and speciation of various clinical isolates of *Candida* by using various phenotypic methods (Juliana, 2004; Marinho *et al.*, 2010).

Materials and Methods

The Present study was held in the Department of Microbiology, ESI Medical College and Hospital, Hyderabad during the period of 1 year from April 2017 to May 2018. Various clinical specimens included such as, urine, sputum, high vaginal swab, nail, skin and blood.

A total of 1,650 specimens were included in this study. Identification and speciation of *Candida* isolates were done as per the standard Microbiological procedures (Duguid, 1989; Chander, 1995; Ajello and Hay, 1998; Koneman *et al.*, 2005; Cooper, 1985; Perry and Miller, 1987; Rousselle *et al.*, 1994).

Results and Discussion

A total of 1,650 specimens, 54 were isolated as yeast like growth. Most of the *Candida* species was isolated from male patients (62.3%) and 37.73% were female patients (Figure 1). Most common age group affected by candidiasis was 21-40 years (28/52.8%) followed by 41-60 years (14/25.9%) (Figure 2). Among all these specimens, urine culture yielded more number of *Candida* isolates (27/50%) followed by sputum (14/25.9%),

high vaginal swab (6/11.1%), nail (3/5.5%), skin (2/3.7%) and blood (2/3.7%) (Figure 3). Out of 54 isolates, one was *Cryptococcus spp* and rest of the isolates were *Candida spp*. Among 53 *Candida species*, 32 were isolated as *Candida albicans* (60.4%), 8 were *Candida tropicalis* (15.09%), 6 were *Candida krusei* (11.3%) and 4 were *Candida glabrata* (7.5%) and 3 were *Candida parapsilosis* (5.7%) (Figure 4).

Currently the opportunistic yeast infection has increased rapidly due to the global rise of immunocompromised individuals. There has been a significant increase in the number of superficial and deep yeast infections with both *Candida albicans* and non-*albicans* species worldwide (Hobson, 2003). The appropriate antifungal therapy is mostly depending on the proper identification of *Candida spp*. In this present study aimed to isolate and characterisation of various *Candida spp* from clinical specimens. Candidiasis can occur at all ages; a report from Mumbai indicated its highest incidence in the age group of 21-40 years (Dalal and Kelkar, 1980). These findings are in concurrence with those of ours, where we found highest number of *Candida* was obtained from the age group of 21-40 years (Figure 2).

The present study demonstrated male preponderance 62.3%, a finding similar to that of Kashid *et al.*, in which involvement was higher in males (55.10%) as compared to the females (44.8%) (Kashid *et al.*, 2011). In this present study, *Candida species* were predominantly isolated from urine (50%) followed by sputum (25.9%), high vaginal swab (11.1%), nail (5.5%), skin (3.7%), and blood (3.7%). Our finding of higher number of isolation of *Candida* from urine is in agreement with many reports which have shown the increased incidence of *Candida* infection in the genitourinary tract in all areas of medical and surgical practice.

Fig.1 Gender wise distribution of candidiasis patients

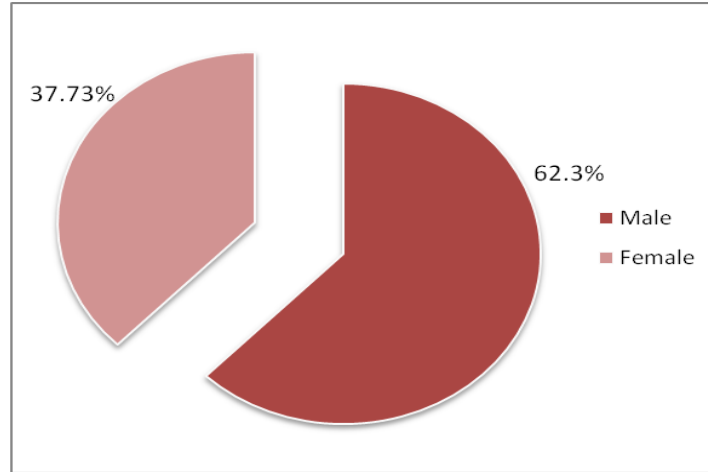


Fig.2 Age wise distribution of candidiasis patients

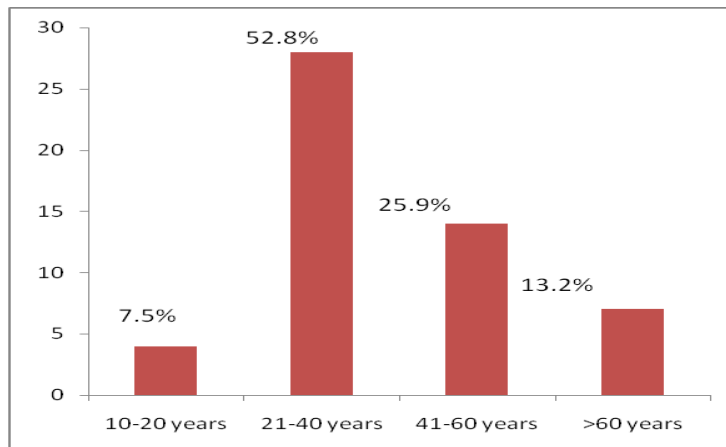


Fig.3 Distribution of *Candida* isolates in various clinical specimens

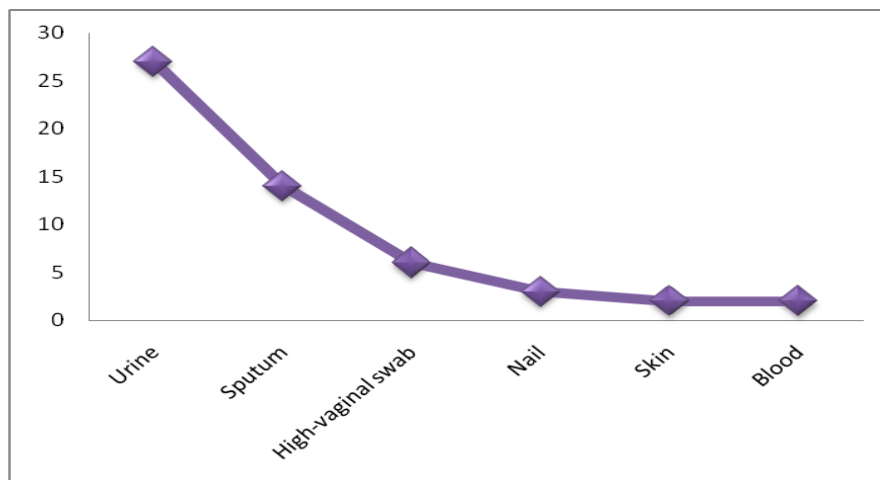
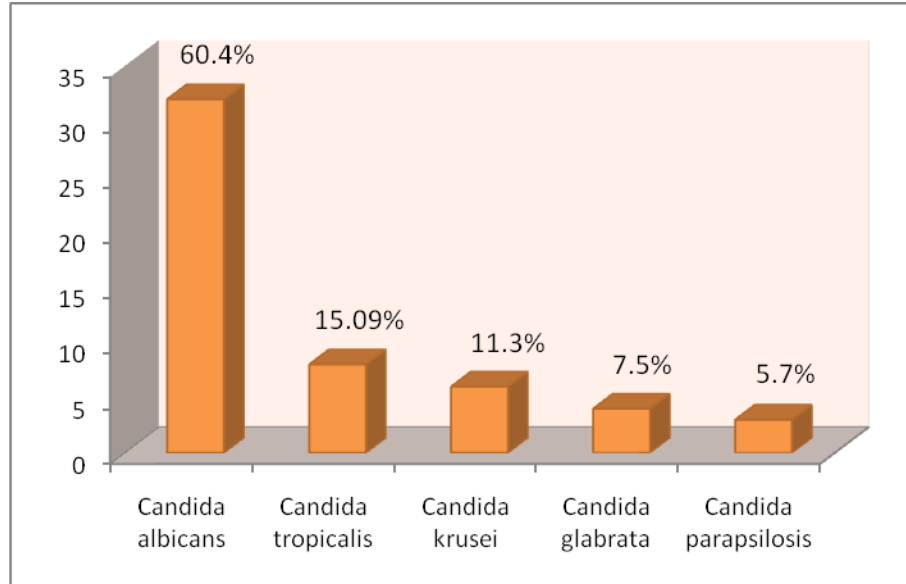


Fig.4 Identification and speciation of *Candida* isolates



Candidal colonization of the urinary tract is common in patients with diabetes, patients receiving broad-spectrum antibiotics or immunosuppressants, or those with long term urinary catheters (Dharwad and Dominic, 2011; Mohandas and Ballal, 2011; Basu *et al.*, 2011). *Candida* is a normal inhabitant of the mouth and can be recovered from sputum in 20 to 55% of normal subjects (Malini, 2000). The role of *Candida* in pulmonary candidiasis and its diagnosis is still controversial. Isolation of *Candida* species from respiratory specimens is frequent in mechanically ventilated patients. Respiratory samples constituted 25.9% of sources of *Candida* in our study. *Candida* species have been found to be one of the most common pathogens causing blood stream infections (Chander, 1995). Nevertheless in our study, only two *Candida* isolate were obtained from blood specimen. *Candida albicans* was the commonest species isolated in our study, which accounts for 60.4% of the total isolates. Our study report was correlated with other study done by (Sengupta *et al.*, 1999). (Kangogo *et al.*, 2011) study reported 86.7% were of *C. albicans*, whereas 13.3% were non albicans *Candida* (Kangogo *et al.*, 2011).

According to Zaini *et al.*, study, 63.5% were isolated as *C. albicans* and 36.5% as non albicans *Candida* (Zaini *et al.*, 2006). The predominance of *Candida albicans* in this study may be due the clinical specimens obtained from hospitalized patients of prolonged hospital stay, pregnancy or catheterised individuals. Among the 21 *Candida non- albicans*, *C. tropicalis* (15.09%) was the most common species isolated in our study. A study done by Basu *et al.*, reported *C. tropicalis* in a similar frequency followed by *C. krusei* and *C. glabrata* (Malini, 2000).

Opportunistic fungal infections are increasing rapidly due to the rising of immunocompromised individuals globally. Therefore, early detection of clinically significant yeast infections are necessary to chose a proper antifungal treatment. There is need of further study with large number of specimens and clinico-epidemiological correlation to understand the prevalence, aetiopathogenesis of opportunistic fungal infections in our community.

Conflict of interest - None

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How to cite this article:

Swathi, S., Taruni, Rajkumar Sade and Nagababu Pyadala. 2018. Phenotypic Characterisation of *Candida* Species from Clinical Isolates in a Tertiary Care Teaching Hospital Hyderabad, India. *Int.J.Curr.Microbiol.App.Sci.* 7(08): 3849-3854.
doi: <https://doi.org/10.20546/ijcmas.2018.708.394>