Original Research Article

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

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A B S T R A C T

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 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

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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
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
References


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