



## Screening and sensitivity of *Candida* isolates from women affected with urinary tract infections at Perambalur, Tamilnadu, India

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### ABSTRACT

This investigation enrolled 75 clinical specimens collected from women with Urinary Tract Infections (UTI) at Perambalur, Tamilnadu, India. Among the 75 samples analysed, 42 were positive for *Candida*. The *Candida* isolates was recorded higher in vaginal swabs (60%) followed by urine sample (53.3%). The collected clinical samples were from the women patients enrolled at the Government Hospital, Perambalur during January 2016 to March 2016. The isolation and identification of *Candida* isolates were done by the study of its morphological, cultural and biochemical characteristics. The species level distinguishing colony morphology was done by yeast extract agar culture. The phenotypic results showed that *Candida albicans* (57.1%) was the predominant species followed by *C. glabrata* (26.2%) and *C. krusei* (16.7%). The antibiotic susceptibility study revealed that all the species of *Candida* isolates were 100% susceptible to Amphotericin B and Nystatin whereas Ketoconazole was evaluated with 90.4% susceptibility.

**Key words:** *Candida* species, Amphotericin B, Nystatin, and Ketoconazole

### INTRODUCTION

*Candida* species is a part of human micro flora and it becomes pathogenic when certain conditions are present and cause opportunistic infections (Ryan and Ray, 2004). *Candida* species are the most common cause of fungal infections worldwide (Amar *et al.*, 2013). The genus is composed of a heterogeneous group of microorganisms and more than 17 different *Candida* species are known to be the etiological agents of human infection (Pahwa *et al.*, 2014). *Candida* disease is not only affects physical and psychological health of patients but also imposes a significant financial expenditure and difficulties for marital relationships and may even lead to infertility (Verghese *et al.*, 2001).

Candiduria, the presence of *Candida* species in urine, is a common clinical finding, particularly in hospitalized patients. Since the 1980s there has been a marked in-crease in opportunistic fungal infections involving the urinary tract, of which *Candida* species are the most prevalent (Platt *et al.*, 1986; Kauffman *et al.*, 2000). The major etiological agent is *Candida albicans*, whereas different *Candida* species can cause a variety of infections including *C. dubliniensis*, *C. glabrata*, *C.*

*guilliermondii*, *C. kefyer*, *C. krusei*, *C. parapsilosis* and *C. tropicalis* which represent many clinical forms of *candidiasis*. Some of these species are encountered as secondary infections to another species, for example; *C. parapsilosis* is secondary infection only when *C. albicans* as a cause of 'Candida endocarditis' (Amy, 2000).

The vast majority of invasive *Candida* infections are caused by only four species which include *C. albicans*, *C. glabrata*, *C. parapsilosis* and *C. tropicalis*. The clinical manifestations of disease are extremely varied, ranging from acute, sub-acute and chronic to episodic. Involvement may be localized to the mouth, throat, skin, scalp, vagina, fingers, nails, bronchi, lungs, gastrointestinal tract or become systemic as in septicaemia, endocarditis and meningitis (Amar *et al.*, 2013).

The *Candida* species are the 4<sup>th</sup> most common organisms causing blood stream infection, and constitute 8% of all nosocomial infections. Candidiasis is mainly caused by *C. albicans*, while there has been striking increase in the frequency with non albicans *Candida* species in last few years. The most important species which are considered pathogenic to humans are *C. albicans*,

*C. tropicalis*, *C. krusei*, *C. glabrata*, *C. lusitaniae* and *C. viswanathii* (Shivaprakash *et al.*, 2007).

## MATERIALS AND METHODS

The present investigation was carried out with 75 female patients who were suspected with urinary tract infection enrolled in the Government Hospital, Perambalur, Tamilnadu, India during January 2016 to March 2016. All patients were married at an age group of 25-40 years. Among the 75 clinical samples, 30 were vaginal swabs and 45 were urine samples.

### Collection of clinical samples

**Vaginal Swabs:** A total of 30 vaginal swabs were obtained from the patients mainly includes with excessive vaginal discharge, pruritis vulva, dysuria, irritation, pregnant and non-pregnant women. Specimens were taken by using sterile bivalve speculum and sterile swabs, and then transported to the laboratory for diagnosis (Koneman and Roberts, 1985). All swabs were subjected to culture for the detection of *Candida* Species.

**Urine samples collection:** The patients were instructed to collect the midstream urine into sterile bottles. Forty five urine samples were collected and transported to the laboratory with ice packs in a sterile container. After that, the samples were centrifuged at 2500 rpm for 10 min. Four plates of Sabouraud's dextrose agar with the addition of 0.05 g/L Chloramphenicol were inoculated: two plates were incubated at 25°C for 48 h and the other two at 35°C for 48 h (Ellis, 1994).

**Identification of *Candida* species:** Two swabs/specimens were taken from each case. The specimens were subjected for direct examination

and the other for the culture. All the above samples were subjected to various mycological tests like direct examination by KOH mount, Gram stain, culture on SDA and Yeast extract agar media. Morphological features of fungi were photographed using Nikon microscope. All the fungi were identified with referred the standard manual of Gillman (1957).

**Disc diffusion method:** The isolated *Candida* species were tested for the antifungal susceptibility. The test was done by disc diffusion method as recommended by CLSI M-44A guidelines on Muller Hinton agar (CLSI, 2009). The antifungal agents used for disc diffusion method were Amphotericin-B (10µg), Nystatin (10µg) and Ketoconazole (10µg).

## RESULTS AND DISCUSSION

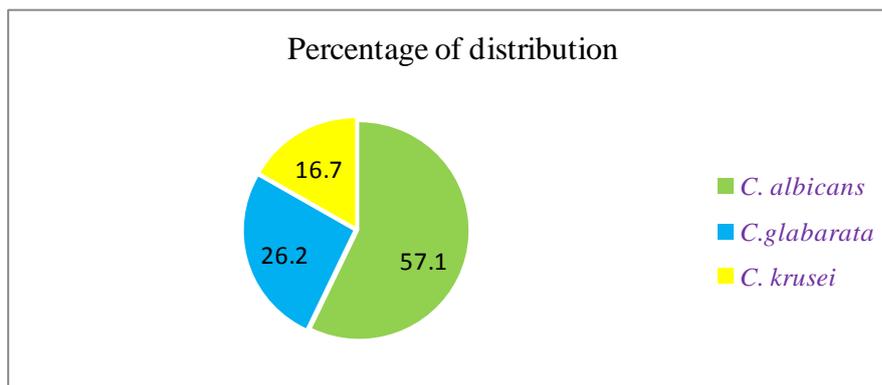
In the present study, total of 75 clinical specimens were collected. Among the 75 samples, 42 were positive for *Candida* (56%). The highest percentage of *Candida* isolates were obtained from vaginal swabs (60%) followed by urine sample (53.3%). The distribution of *Candida* isolates in various specimens was displayed in Table 1. *Candida albicans* (24) was the predominant species followed by *C. glabrata* (11) and *C. krusei* (7). The distribution of different *Candida* species is displayed in Table 2. All species of *Candida* isolates were susceptible to Amphotericin B and Nystatin. The next effective antifungal drug was Ketoconazole with 90.4% (38) *Candida* isolates susceptible to it. The result of the antifungal susceptibility test of all isolates was displayed in Table 3.

**Table-1. Occurrence of *Candida* species in the clinical samples collected from women with Urinary Tract Infections**

Samples	Age group of Patients	Number of specimens tested	Number of sample positive	Percentage of positive samples
Vaginal fluid	30-40	30	18	60.0
Urine	25-40	45	24	53.3

**Table-2. *Candida* species identified in the clinical samples collected from women with Urinary Tract Infections**

<i>Candida</i> species	Number of isolates	Distribution percentage
<i>Candida albicans</i>	24	57.1
<i>Candida glabrata</i>	11	26.2
<i>Candida krusei</i>	7	16.7
Total	42	100

**Fig. 1 Distribution of Candida species isolated in the clinical samples collected from women with Urinary Tract Infections****Table-3 Antifungal sensitivity pattern of the Candida isolates on different antibiotics by disc diffusion assay**

Anti fungal agents	Zone of inhibition in mm		
	<i>C. albicans</i> (n=24)	<i>C. glabarrata</i> (n=11)	<i>C. krusei</i> (n=7)
Amphotericin B	100%	100%	100%
Nystatin	100%	100%	100%
Ketoconazole	78.5%	65.3%	69.5%

Candidiasis is one of the most diverse fungal infections that can lead to superficial, such as vaginitis, to systemic and potentially life-threatening diseases. Genital involvement in women is one of the most common presentations due to *Candida*. Vaginal candidiasis results from abnormal growth of *Candida* in the genital tract mucosa and has increased dramatically in the recent years. This infection is a worldwide health problem and affects millions of women, annually (Ilkity and Guzel, 2011). The frequency of fungal infections caused by *Candida species* has amplified over the past few years, especially in immunocompromised patients. There is also an increase in the frequency of non albicans species causing infection commonly *Candida tropicalis*, *Candida krusei*, and *Candida guilliermondii*. In our study, incidence of *Candida* isolation was 56%

which correlates with study done by Mohandas and Ballal (2011). The antifungal susceptibility of the *Candida* isolates to Amphotericin B and Nystatin revealed that all the isolates were sensitive to it. Our study also agreed with the findings of similar studies done on *Candida* (CLSI, 2009; Maria Fatima Sugizaki *et al.*, 1998). The next effective antifungal drug was found Ketoconazole with 90.4%. Thirty eight *Candida* isolates were found susceptible to it. These findings correlate with study done by Ragini Ananth Kashid *et al.* (2011). In conclusion, identification of *Candida* isolated from various clinical specimens and speciation has become increasingly important as the changing epidemiology of *Candida* infections calls for monitoring of species distribution and susceptibility of *Candida* in order to successfully manage such cases.

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