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RESEARCH ARTICLE

SPECIATION OF *CANDIDA* ISOLATED FROM URINE SAMPLES IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Candiduria is a relatively rare finding in otherwise healthy people but common in hospital settings. It may signal colonization or contamination which may not need treatment. It may also be a marker of lower UTI or upper UTI which may need treatment.
Materials and Methods: A total of 350 isolates of *Candida* were included in this study. *Candida* isolates were identified by Gram stain, growth on Sabauraud's dextrose agar, Germ tube test and sugar assimilation tests.
Results: Out of 14,986 samples, 350 *Candida* isolates were identified. 176 were males and 174 were females. *Candida tropicalis* (74%), *Candida albicans* (16%), *C.lipolytica* (4.2%), *C.glabrata* (4.2%), *C .parapsilosis (1.5%), C.krusei* (1%) were the species isolated from urine. 175 isolates had colony counts of $>10^5$ Cfu/ml.
Conclusion: The present study shows that incidence of non *Candida* albicans is more than *Candida* albicans. Species identification helps in choosing the appropriate antifungal agent.

INTRODUCTION

The definition of candiduria is very enigmatic. As neither the diagnostic criterion (CFU cutoff) nor the collection technique (suprapubic aspiration versus bag collection) for neonatal urinary candidiasis is standardized. In adults the colony forming unit (CFU) criteria to diagnose candiduria ranges from 10^3 to 10^5 CFU/ml urine (Achkar and Fries, 2010). Anatomical defects of urinary tract, indwelling urinary drainage devices, abdominal surgery, ICU stay, broad spectrum, antibiotic therapy, diabetes mellitus, increased age and female sex are risk factors associated with candiduria (Bobade 2013). It is increasing becoming an important cause of nosocomial urinary tract infection (10-15%) (Lundstrom and Sobel, 2001). The presence of *Candida* species in urine samples presents the physician with a challenge as to whether the candiduria represents colonization or, lower or upper urinary tract infection and renal candidiasis with sepsis (Bukhary, 2008). Aim of the present study was to determine the prevalence of *Candida* species in urine and to assess significance by correlating it with urine microscopy and colony counts.

MATERIALS AND METHODS

The present study was carried out in tertiary care teaching hospital in Bangalore. A total of 14,986 urine samples were received for routine bacteriological and fungal cultures.

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Urine specimens were Gram stained and inoculated onto Blood agar and Cysteine lactose electrolyte deficient medium (CLED) for routine and onto Sabouraud's dextrose agar fro fungal cultures. All *Candida* isolates were further identified by Germ tube test and sugar assimilation tests. Repeat samples were requested to assess clinical significance of the isolates. Demographic and clinical data were collected from patient records.

RESULTS

Total number samples received in a year time was 14, 986, the number of *Candida* isolates were 350.Number of males were 176 and females174, there was not much of statistical difference among sexes. Out of 350 isolates, 259 (74%) were *Candida tropicalis*, 56(16%) *Candida albicans*, *Candida lipolytica* 14(4.4%), *Candida glabrata* were 14(4.2%), *Candida parapsilosis* 6 (1.5%), and *Candida krusei* 3(1%) Fig. 1. 175 isolates had colony counts of $>10^5$ Cfu/ml. 96(54.8) of theses 175 isolates showed pus cells and yeast cells in direct smear of the urine. Only when repeat sample had growth of *Candida* further workup was done. 6 patients had also grown *Candida* from blood, tracheal trap, cervical swab, stool, pus and central venous catheters. Most of the isolates were from patients admitted in ICU and medicine wards Fig.2. We tried to analyse the diagnosis of the patients from whom it was isolated, about 47 were cases of sepsis, 40 cases of UTI; diabetes was co morbidity in 33 cases. Fig 3

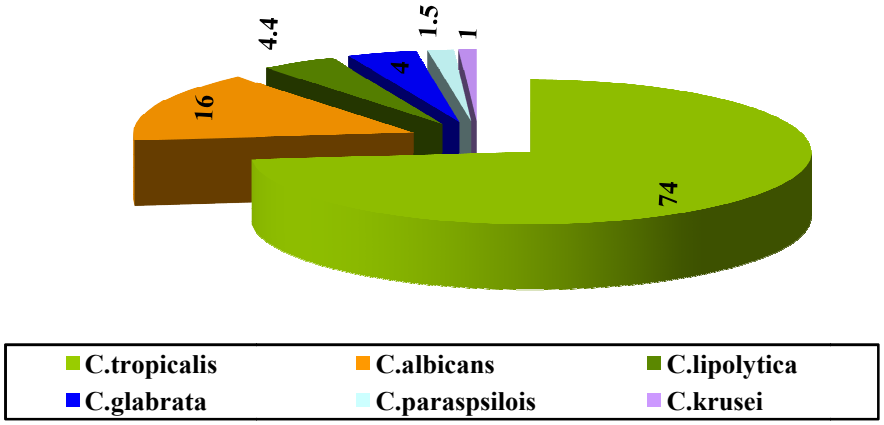

Fig.1. *Candida* Species

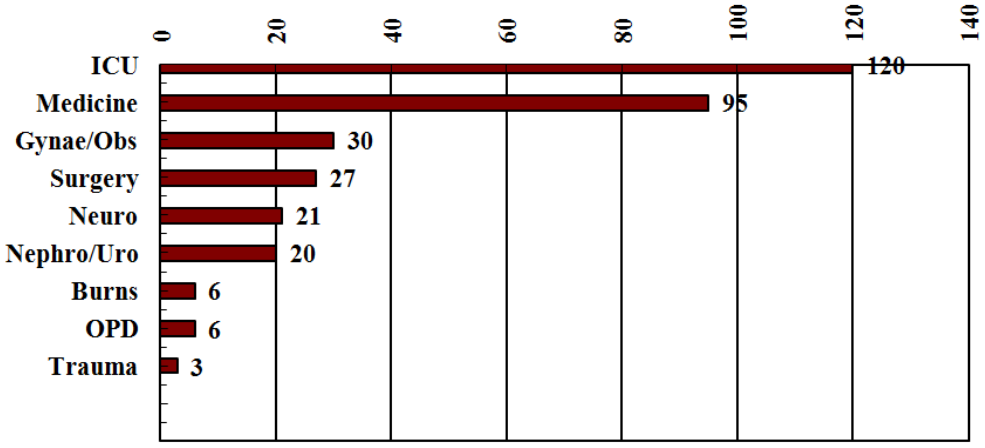

Fig. 2. Ward Wise distribution of isolates

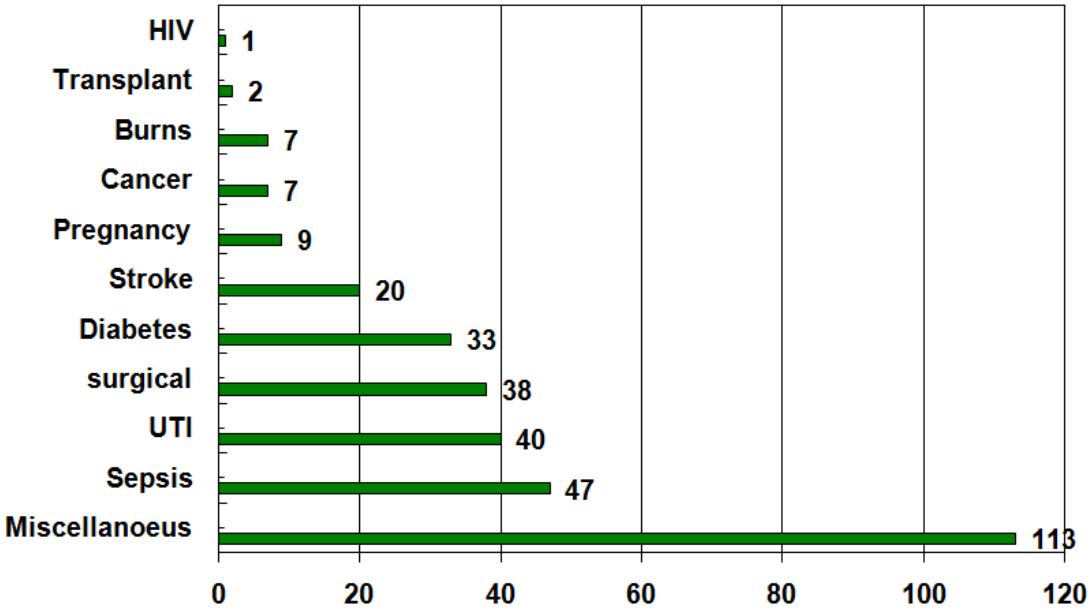

Fig. 3. Clinical Diagnosis

DISCUSSION

Candida tropicalis was the predominant species isolated from our patients.98% of the isolates were from in-patients, 34.2% was from ICU and these patients were on treatment with multiple antibiotics and catheterised. No difference in incidence was observed in male and female patients. Significant colony counts may not always be representative of infection in Candiduria. Presence of pus cells may be an indicator of infection in non catheterized patients. *Candida* urinary tract infections are an increasing prevalent nosocomial problem with uncertain significance (Guler *et al.,* 2006). In a recent case controlled study it was shown that the risk to develop candiduria was increased 12-fold after urinary catheterization, six fold each after use of broad spectrum antibiotic and urinary tract abnormalities, four fold following abdominal surgeries, two fold in presence of diabetes mellitus and one fold in association with corticosteroid administration (Guler *et al.,*2006).

In our study *Candida tropicalis* was the most common fungal isolate found in urinary tract infection, followed by *C. albicans*. Similar fungal profile has been reported by other studies from India (Jain *et al.,* 2011; Al Benwan *et al.,* 2010; Paul *et al.,* 2007), whereas *C. albicans* was the most common isolate followed by *C. glabrata* from studies done outside India (da Silva *et al.,* 2007; Fraisse *et al.,* 2011; Ozhak-Baysan *et al.,* 2012; Febré *et al.,* 1999).

Pyuria was observed in more than 54% of cases in whom the colony counts were > 10^5 Cfu/ml. pyuria usually supports the diagnosis of infection (Lundstrom and Sobel, 2001; de oliveria *et al.,* 2001). Absence of pyuria and low colony counts tend to rule out *Candida* infection. Treatment for symptomatic patients, fluconazole is the antifungal drug of choice provided the organism isolated is not *C.glabrata* or *C.krusei* as they are fluconazole resistant. Amphotericin B is drug of choice those conditions. Nevertheless, susceptibility testing of *Candida* species is not routine procedure in many laboratories. At least speciation could help us with the presumptive treatment of candiduria.

Conclusion

Fungal infections are becoming increasingly common and the line between colonization, contamination and infection is not very well demarcated. The approach to patient with candiduria needs to be individualized. Usually absence of pyuria and low colony counts rules out *Candida* infection. Repeated isolation from carefully collected midstream urine sample, presence of pyuria and underlying of risk factors favour the diagnosis of *Candida* infection (Lundstrom and Sobel, 2001).

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