SPECIATION AND ANTIFUNGAL SUSCEPTIBILITY TESTING OF CANDIDA ISOLATED FROM URINE

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**Abstract**

Candiduria is uncommon and appears more often in females and catheterized males. *Candida* species most frequently identified. Our results provide contemporary insight into the antifungal susceptibility profile of Candida species causing candiduria.

**Keywords:** Candida Isolated.

**Introduction**

Urinary tract infections are among the most common infectious diseases in humans. Urinary tract infection (UTI) is an extremely common disorder in clinical practice. It encompasses a wide variety of clinical entities whose common denominator is microbiological invasion of any tissue of urinary tract extending from the renal cortex to the urethral meatus. Candida UTI or candiduria is a common finding in hospitalized patients.

*Candida* species are unusual causes of urinary tract infections in healthy individuals, but common in hospital settings or among patients with predisposing diseases and structural abnormalities of the kidney and collecting system. Incidence of *Candida* has been on rise worldwide.

The interpretation of the significance of the recovery of *Candida* from urine specimens is often difficult. Candiduria may represent contamination, colonization of the urinary catheter or of the bladder. Most cases of candiduria are asymptomatic and treatment is rarely necessary.

Since the 1980s there has been a marked increase in opportunistic fungal infections involving the urinary tract, of which *Candida* species are the most prevalent. *Candida* species in measurable quantities in the urine (candiduria) are found in < 1% of clean voided specimens in healthy persons but account for 5% of all urine culture results in the general hospital setting and 10% of urine isolates in tertiary care facilities.

All common *Candida* species are capable of causing urinary tract infections (UTIs). Majority of fungal infections of the urinary tract are caused by *Candida* species. As *Candida* spp. is a human commensal, its isolation from urine is challenging for both clinician and microbiologist. Candida UTI or candiduria is a common finding in hospitalized patients. Anatomic defects of urinary tract, abdominal surgery, use of immunosuppressive agents, use of catheters, and interruption of the flow of urine, radiation therapy, and genitourinary tuberculosis ICU stay, broad spectrum antibiotic therapy, diabetes mellitus, increased age, and female sex are risk factors associated with candiduria. Prior use of Antibiotics is a known risk factor for candiduria.

Candiduria has become a potential source of morbidity and mortality if untreated. So we undertook a prospective study to note the incidence of *Candida* species in patients with urinary tract infection with special reference to speciation, antifungal susceptibility and the associated risk factors.

**Material and Methods**

The study was conducted at the Department of Microbiology, JSS Medical College and Hospital, Mysore. A total of 50 Candida spp. isolated from urine samples were included in 2 months study period. Speciation of Candida was...
done by the Vitek-2 compact system & conventional methods used for speciation of yeast isolates were germ tube test, chlamydospore formation test on corn meal agar, sugar fermentation test and sugar assimilation test. Antifungal susceptibility testing of the isolates was performed by disc diffusion method on glucose methylene Mueller- Hinton agar (GM-MH) and Vitek 2 compact system.

Results and discussion
Among 50 isolates *C.tropicalis* & *C.albicans* were predominant species among 9 different species Candida non albicans like *C.glabrata*, *C.parapsilosis*, *C.famata*, *C.spherica*, *C.guilliermondii*, *C.krusei*, *C.haemulonii* were also isolated from urine samples. Emergence of different species of Candida from urine is confirmed by speciation tests conducted.

50 isolates were subjected to Antifungal test by Disc Diffusion Method revealed following results: 4% of *C.tropicalis*, 4% of *C.albicans*, 4% of *C.parapsilosis*, 2% of *C.glabrata* & 2% of *C.krusei* showed resistance to Fluconazole, rest 84% species were sensitive to Fluconazole.

2% of *C.albicans*, 2% of *C.tropicalis*, 2% of *C.glabrata*, 2% of *C.haemulonii* showed resistance to Voriconazole, rest 92% were sensitive to Voriconazole. 4% of *C.parapsilosis*, 2% of *C.albicans*, 2% of *C.glabrata*, 2% of *C.tropicalis*, 2% of *C.haemulonii* were resistant to AmphotericinB, rest 88% were sensitive to AmphotericinB.

2% of *C.albicans* & 2% of *C.haemulonii* showed resistance to Ketoconazole, rest 96% were sensitive. All isolates were sensitive to Itraconazole.

**Graphical representation of total no of species of candida isolated from urine**
Susceptibility Testing Of Candida Species By Disc Diffusion Method

**TABLE**

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Number</th>
<th>S(%)</th>
<th>R(%)</th>
<th>S(%)</th>
<th>R(%)</th>
<th>S(%)</th>
<th>R(%)</th>
<th>S(%)</th>
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<td>C.krusei</td>
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<td>1(100)</td>
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- ITR-Itraconazole(10µg), AMP-B-Amphotericin-b(20µg), KETO-Ketoconazole(50µg), VORI-Vorionazole(1µg), FLU-Fluconazole(10µg)
- In the table C.albicans and Candida non albicans showed resistance to all drugs except Itraconazole. Among 50 isolates Ketoconazole resistance was observed in 2% of C.albicans, 2% of C.glabrata, 2% of C.parapsilosis, 2% of C.glabrata, and 2% of C.krusei showed resistance to Itraconazole. Rest 84% species were sensitive to Fluconazole.
- 2% of C.albicans, 2% of C.tropicalis, 2% of C.glabrata, 2% of C.parapsilosis showed resistance to Voriconazole, rest 92% were sensitive to Voriconazole. 4% of C.parapsilosis, 2% of C.albicans, 2% of C.glabrata, 2% of C.tropicalis, 2% of C.haemulonii resistant to AmphotericinB. Rest 88% were sensitive to AmphotericinB.

**Summary and conclusion**

Candiduria is uncommon and appears more often in females and catheterized males. C.albicans and C.tropicalis were the species most frequently identified. Our results provide contemporary insight into the antifungal susceptibility profile of Candida species causing candiduria.

Surveillance of health care associated infections, so as to define the magnitude and nature of the problem, is the major step towards reducing the risk for infection in vulnerable hospitalized patients. The present surveillance study helped us to generate institutional data regarding CAUTI in ICU patients with a special reference to candiduria. In our institute, the incidence of candiduria was low. The predominance of NAC spp. over C.albicans was noted. Surveillance of health care associated infections though a very tedious process has many beneficial outcomes. The data obtained from surveillance can convince clinicians and hospital administrators of the need for improvements in infection prevention and control practices.

The presence of Candida in urine is a diagnostic and therapeutic challenge for physicians’ right from the general practitioner to the specialist. Candiduria is becoming an important nosocomial infection. The shift towards the NAC spp. as the causative agent of candiduria has generated the concern. Since several NAC spp. are inherently resistant to common antifungal agents, the rapid identification of Candida isolates up to species level along with its in-vitro antifungal susceptibility pattern is important for treatment and management of candiduria.
References


