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Isolation and susceptibility of *candida sp*. from acquired urinary tract infections

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Abstract

Urinary tract infection (UTI) is the most common hospital acquired infection, accounting for 40% of all hospital acquired infections. In this present study isolation and susceptibility of Candida sp. from acquired urinary tract infections. The UTI urine samples were collected from various hospitals and collected samples were inoculated on HiCrome Candida Differential Agar for isolation of UTI pathogens. An isolated Candida sp. was identified based on cultural and morphological characteristic. The antibiotic sensitivity of isolated Candida sp. to the commercial antibiotic tests was analyzed by disc diffusion method. Four different UTI isolates were observed after 40-48 Hrs incubation from collected samples such as Candida albicans, Candida glabrata, Candida krusei and Candida tropicalis. The Ketoconazole and Miconazole have maximum antifungal activity against Candida sp. when compared to other antibiotics.

Keywords: *Antifungal activity, urinary tract infections, Candida sp.*

1. Introduction

Candida species yeast cells were present in the urine is known as cadiduria and nowadays increasingly frequent finding in hospitalized UTI persons. The cadiduria were asymptomatic as there without associated signs and symptoms and though quantitative cultures with colony count of $>10^5$ /ml of urine are associated with infection in patients without indwelling catheters in contrast, clinically significant renal Candidiasis has been reported even with low colony counts of 10^3 /ml of urine. Moreover pyuria usually supports diagnosis of Candida infection. It involves vast majority of patients, however, Candiduria most likely reflects colonization or infection of lower urinary tract or collecting system of kidneys (Jagdish Chander, 1998). *Candida* spp is one of the most common causes of nosocomial urinary tract infections (Achkar and Fries, 2010). Prolonged hospitalizations, long stay in NICU, urinary tract abnormality, immunocompromised patients, broad spectrum antibacterial therapy for long time and prophylaxis by antifungal agents are presented as important risk factors for urinary tract infections (Seifi *et al.*, 2013). Candiduria in hospitalized patients in intensive care unit (ICU)/NICU can be a relevant marker for systemic candidiasis (Da silva *et al.*, 2007). In the present study isolation and susceptibility of *Candida sp.* from acquired urinary tract infections.

2. Materials and Methods

The urine samples were collected from Various Hospital at Thanjavur, Tamilnadu, India. The collected specimens were stored on specific aseptic container, for further study. The specimens were inoculated on HiCrome Candida Differential Agar and incubated at 30°C for 40-48 Hrs. *Candida* species grew on HiCrome agar appearing as a different colour of colony. The antibiotic sensitivity of isolated Candida species to the commercial antibiotic tests was analyzed by disc diffusion method. Antibacterial activity test was carried out

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following the modification of the method originally described by Bauer *et al.*, (1966). The obtained results in the present investigation were subject to statistical analysis.

4. Results and Discussion

Four different UTI Candida isolates were observed after 24 hrs incubation from collected samples the results were shown in Table 1. The *Candida albicans* (9%) maximum level was observed in collected UTI sample compare than other isolates. This finding is well correlated with other studies. It has been reported that 11to 52% of nosocomial urinary tract infections are caused by *Candida* spp. (Richards *et al.*, 2000). Increased age, female sex, antibiotic use, urinary drainage devices and prior surgical procedures are considered as risk factors for candiduria (Kauffman, 2005). The *Candida glabrata* and *Candida krusei* infected range are 7 and 6 %. *Candida tropicalis* was noted 4 % only. All Candida species are capable of causing urinary tract infections. Although, 50-70% of candiduria are caused by *C. albicans*. (4,20,23,24) However, during last two decades incidence of non albicans species was also increased (Lundstrom and Sobel, 2001). In the present study, most of the candiduria have been caused by *Candida albicans* (9 %) which correlates with the study by Yashavantha *et al.* (2013) some of the clinicians have believed that the presence of *Candida* species in urine samples is marked as harmless colonization, or lower tract infection. HiCrome™ Candida Differential Agar is a selective and differential medium, which facilitates rapid isolation of yeasts from mixed cultures and allows differentiation of Candida species namely *C.albicans, C.krusei, C.tropicalis* and *C.glabrata* on the basis of colouration and colony morphology (Table 2). On the other hand, candiduria is well- known as an important risk factor for invasive candidiasis with considerable morbidity and mortality (Manzano-Gayosso *et al.*, 2008). The commercial antibiotics were tested against *Candida* species the results were represented in Table - 3. The Ketoconazole and Miconazole have maximum antifungal activity against *Candida* species when compared to other antibiotics.

5. Tables

Table 1: Isolation of UTI pathogenic *Candida* species from urine sample

S. No.	Isolated *Candida* species	Percentage (%)
1	*Candida albicans*	9
2	*Candida glabrata*	7
3	*Candida krusei*	6
4	*Candida tropicalis*	4
5	Bacterial Isolates	16
7	No growth	56
8	No. of samples	98

Table 2: Identification of isolated *Candida* species

S. No.	Isolated *Candida* species	Growth	Colour of Colony
1	*Candida albicans*	Good-luxuriant	Light green
2	*Candida glabrata*	Good-luxuriant	Cream to white
3	*Candida krusei*	Good-luxuriant	Ppurple fuzzy
4	*Candida tropicalis*	Good-luxuriant	Blue to purple

*HiCrome™ Candida Differential Agar (M1297A)

Table 3: Antibiotic sensitivity test using commercial antibiotics

Antibiotics	Zone of Inhibition (mm in diameter) (M±SD) n=3			
	Candida albicans	*Candida glabrata*	*Candida krusei*	*Candida tropicalis*
Amphotericin-B	15±0.12	10±0.22	12±0.12	10±0.14
Clotrimazole	18±0.42	19±0.72	10±0.11	14±0.42
Fluconazole	-	22±0.50	-	-
Itraconazole	16±0.84	14±0.84	14±0.14	10±0.18
Ketoconazole	34±0.10	30±0.82	28±0.10	33±0.10
Miconazole	32±0.18	31±0.18	32±0.18	31±0.18
Nystatin	12±0.10	13±0.09	12±0.07	11±0.10

Values are expressed Mean ± Standard deviation; n=3

6. Conclusions

In this study four different *Candida* species were isolated from acquired urinary tract infections. The results indicated the *Candida albicans* maximum level was compared than other bacterial isolates. HiCrome™ Candida Differential Agar is a selective and differential medium, which facilitates rapid isolation of yeasts from mixed cultures and allows differentiation of Candida species namely *C.albicans, C.krusei, C.tropicalis* and *C.glabrata* on the basis of colouration and colony morphology. The Ketoconazole and Miconazole have maximum antifungal activity against *Candida sp.* when compared to other antibiotics.

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