



STUDY OF CANDIDA ISOLATES FROM URINARY TRACT INFECTION IN PATIENTS IN A TERTIARY CARE HOSPITAL, NORTH BIHAR

Dr. Shweta	Tutor, Department of Microbiology, SKMCH, Muzaffarpur, Bihar, India
Dr. Poonam Kumari	Associate Professor & HOD, Department of Microbiology SKMCH, Muzaffarpur, Bihar, India
Dr Narendra Kumar*	Senior Resident, Department of Paediatric Surgery, SKMCH, Muzaffarpur, Bihar, India *Corresponding Author

ABSTRACT **Background:** UTI is an important cause for fever in infants and neonates. Common risk factors for Candida infection includes prematurity, prolonged hospitalization, broad spectrum antibiotic therapy, use of catheter, total parenteral nutrition and renal and urinary tract malformations. **Materials and Methods:** This retrospective study was conducted in the Department of Microbiology at SKMCH Muzaffarpur from January 2025 to December 2025. A total of 10 µL of each uncentrifuged and homogenised urine sample was cultured with a calibrated loop on Cysteine Lactose Electrolyte Deficient (CLED) agar, (Himedia, Mumbai, India) incubated overnight at 37°C for 18 hours, aerobically. **Results:** The study was conducted on 1312 urine samples received from different clinical departments, among 690 samples were culture positive, out of which 431 (62.46%) Candida species and 259 (37.54%) other candida spp. were reported while 622 (47.40%) were culture negative. Out of total 690 patients 201 (29.1%) patients were male and 489 (69.56%) patients were female. Out of 690 patients 15 (2.18%) in between age group of 0-10 years, 51 (7.5%) patients in between the age group of 11-20 years and incidence rate was high 304 (44.0%) in patients between the age group of 21-30 years, 580 (84.0%) samples were received from ICU and 110 (15.9%) sample were received from non-ICU, 586 (84.92%) patients were reported with diabetic and 104 (15.0%) patients were reported with non-diabetic, 252 (36.52%) patients were from general medicine department, 141 (20.44%) patients were from general surgery department, 87 (12.60%) patients were from paediatrics department and 210 (30.44%) patients were from obstetrics and gynaecology. **Conclusion:** NAC has caused more UTIs, but *C. albicans* remains the most common fungal cause of UTIs. Clinicians are facing challenges to treat the Candida infection due to emergence of resistant strains.

KEYWORDS : Candiduria, Candida Albicans, Non-albicans Candida, Antifungal Drugs, Urinary Tract Infection, CHROM Agar.

INTRODUCTION

UTI is an important cause for fever in infants and neonates. Common risk factors for Candida infection includes prematurity, prolonged hospitalization, broad spectrum antibiotic therapy, use of catheter, total parenteral nutrition and renal and urinary tract malformations. Although *C. albicans* is the most frequently reported species in candidal urinary tract infection but non-albicans Candida species also increasing now as the causative agent of UTI as reported in many studies. *C. tropicalis*, *C. glabrata*, *C. parapsilosis*, *C. lusitanae*, *C. guilliermondii* and *C. krusei* are non-albicans species that cause candiduria.¹

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Microbiology at SKMCH Muzaffarpur from January 2025 to December 2025. The study was conducted on 1312 urine samples received from different clinical departments, among 690 samples were culture positive, out of which 431 (62.46%) Candida species and other candida spp. 259 (37.54%) were reported while 622 (47.40%) were culture negative. Candiduria and Candida UTIs data were collected from Institute's microbiology records retrospectively. Only urine samples received from inpatient and outpatient during the given period were included in this data screening. The collection of patient data, which contained only demographic information and the indication for the submission of samples, was also conducted. The term candiduria in clinical microbiology is described as the isolation of Candida species from urine samples on at least one occasion with $>10^3$ CFU/mL.

Inclusion Criteria

Microbiology fungal culture records which were related to only urine samples from all wards and ICU were included in the study retrospectively. Pure growth of yeast isolates having significant colony count $>10^3$ CFU/mL.

Exclusion Criteria

The study excluded other clinical samples from all wards and ICU. A colony counts less than 10^3 CFU/mL was excluded from the study.

Data Collection

Isolate Identification: A total of 10 µL of each uncentrifuged and homogenised urine sample was cultured with a calibrated loop on Cysteine Lactose Electrolyte Deficient (CLED) agar, (Himedia, Mumbai, India) incubated overnight at 37°C for 18 hours, aerobically. If the colony count was 105 or more CFU/ml and upon suspicion of Candida spp. a wet mount of an isolated colony was prepared and

examined during microscopy and after confirmation of the Candida spp. the isolates were further processed as per standard protocol [7]. Fungal colony morphology was confirmed by using Sabouraud Chloramphenicol Agar (Himedia, Mumbai, India), germ tube production, and micro morphology on Potato Dextrose Agar (PDA) (Himedia, Mumbai, India) and HiCrome Candida Differential Agar (Himedia, Mumbai, India). All clinical samples were processed according to standard microbiology protocol [7] with standard ATCC 25923 control strains.²

RESULT :-

Table 1: Distribution of Patients According to Sex (n= 690) :-

SEX	No. of cases	Percentage
Male	201	29.1%
Female	489	69.56%

Table 2 : Distribution of Patients According to Age (n= 690) :-

Age	No. of cases	Percentage
0-10	15	2.18%
11-20	51	7.5%
21-30	304	44.0%
31-40	135	19.55%
41-50	80	11.5%
51-60	49	7.10%
61-70	36	5.22%
71-80	20	3.0%
Total	690	100%

Table 3: Distribution of Patients According to Samples Recived from ICU and non-ICU:-

ICU and non-ICU	No. of cases	Percentage
ICU	580	84.0%
non-ICU	110	15.9%

Table 4: Distribution of Patients According to Co-morbidity :-

Co-morbidity	No. of cases	Percentage
Diabetic	586	84.92%
Non-Diabetic	104	15.0%
Total	690	100%

Table 5: Distribution of Patients According to Samples Recived from Different Departments:-

Departments	cases	Percentage
General medicine	252	36.52%

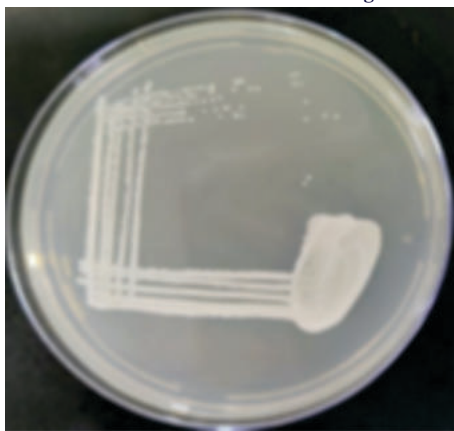
General surgery	141	20.44%
Paediatrics	87	12.60%
OBGY	210	30.44%
Total	690	100.0%

Table 6: Prevalence of Candida Spp. :-

Candida albicans	431 (62.46%)
Other candida spp.	259 (37.54%)
Other	690 (100%)

Table 7: Overall Distribution of Fungal Isolates:-

S.no	Species	No. of Isolates (%)
1.	C. albicans	491 (71.16%)
2.	C. tropicalis	85 (12.32%)
3.	C. glabrata	66 (9.56%)
4.	C. krusei	32 (4.65%)
5.	C. parapsilosis	8 (1.15%)
6.	C. guilliermondii	6 (0.87%)
7.	C. kefyr	2 (0.29%)
8.	TOTAL	690 (100%)

**Characteristics of Candida Auris on CHROM Agar****Colony Characteristics of Candida Auris on Sabouraud Dextrose Agar**

DISCUSSION

This retrospective study was conducted in the Department of Microbiology at SKMCH Muzaffarpur from January 2025 to December 2025. The study was conducted on 1312 urine samples received from different clinical departments, among 690 samples were culture positive, out of which 431 (62.46%) Candida species and other Candida spp. 259 (37.54%) were reported while 622 (47.40%) were culture negative. Candiduria and Candida UTIs data were collected from Institute's microbiology records retrospectively. Only urine samples received from inpatient and outpatient during the given period were included in this data screening. The collection of patient data, which contained only demographic information and the indication for

the submission of samples, was also conducted. The term candiduria in clinical microbiology is described as the isolation of Candida species from urine samples on at least one occasion with $>10^3$ CFU/ml.

In this study Table 1 shows the distribution of patients according to sex. Out of total 690 patients 201 (29.1%) patients were male and 489 (69.56%) patients were female, showing a female preponderance.

In a study done by Shakir Alam (2023)³ found that Out of 170 patients 50 patients were male (29.41%) and 120 patients were female (70.58%), showing a female preponderance. The demographic pattern—female predominance (60%) and higher prevalence in older patients—is consistent with prior literature. Risk factors such as female gender, indwelling catheters, age, and prior antibiotic use were recurrently cited as predisposing conditions.⁴

In this study Table 2 shows the distribution of patients according to age. Out of 690 patients 15 (2.18%) in between age group of 0-10 years, 51 (7.5 %) patients in between the age group of 11-20 years and incidence rate was high 304 (44.0%) in patients between the age group of 21-30 years, 135 (19.55%) in between the age group of 31-40 years, 80 (11.5%) in between the age group of 41-50 years, 49 (7.10%) in between age group of 51- 60 years, 36 (5.22%) patients in between age group of 61-70 years and the least incidence rate 20 (3.0%) was found in 71-80 years.

In a study done by Neeti Mishra (2022)⁵ also found that the incidence rate was high 105 (59.7%) in patients between the age group of 21-30 years and the least incidence rate 4 (2.3%) was found in 71-80 year age group patients.

In this study Table 3 Shows distribution of cases according to sample received from ICU /non -ICU. Out of 690 samples 580 (84.0%) samples were received from ICU and 110 (15.9%) sample were received from non -ICU. In a study done by Neeti Mishra (2022)⁵ also found that the majority of cases were found from ICU patients 161 (91.5%) and the incidence rate was very less (8.5%) for non ICU patients.

In this study Table 4 shows distribution of patients according to comorbidity. Out of 690 patients 586 (84.92%) patients were reported with diabetic and 104 (15.0%) patients were reported with non -diabetic. In a study done by Shakir Alam (2023)³ found that Out of 170 patients 158 patients were reported with diabetic (92.94%) and 12 patients were reported with non -diabetic (7.06%).

In this study Table 5 Shows distribution of patients according to samples received from different departments. Out of 690 patients 252 (36.52%) patients were from general medicine department, 141 (20.44%) patients were from general surgery department, 87 (12.60%) patients were from paediatrics department and 210 (30.44%) patients were from obstetrics and gynaecology. Similar findings were also observed in the Study done by Shakir Alam (2023)³ Out of 170 patients 81 patients were from general medicine department (47.64%), 26 patients were from general surgery department (15.29%), 9 patients were from paediatrics department (5.29%) and 54 patients were from obstetrics and gynaecology (31.76%).

In this study Table 6 shows the prevalence of candida spp. Out of 690 patients, 431 (62.46%) patients were reported with candida albicans and 259 (37.54%) patients were reported with Other Candida spp.

In a study done by Leticia Castellano-Sánchez (2025)⁶ found that the most frequently isolated species was Candida albicans (54.25%; 1466/3037), followed by Nakaseomyces glabrata (22.78%; 692/3037) and Candida tropicalis (10.2%; 311/3037).

In this study TABLE 7: Overall distribution of fungal isolates shows C. albicans 491 (71.16%), C. tropicalis 85 (12.32%), C. glabrata 66 (9.56%), C. krusei 32 (4.65%), C. parapsilosis 8 (1.15%), C. guilliermondii 6 (0.87%), C. kefyr 2 (0.29%). In a study done by Saumya (2025)⁴ the nonalbicans Candida (NAC) species were more prevalent (60.77%) than Candida albicans (39.23%), most frequently isolated NAC species was Candida tropicalis (29.23%), followed by C. glabrata (18.46%) and C. krusei (13.08%).

CONCLUSION

NAC has caused more UTIs, but C. albicans remains the most common fungal cause of UTIs. Clinicians are facing challenges to treat the

Candida infection due to emergence of resistant strains. As a result of drug resistance, clinicians face challenges in treating Candida infections. Many new antifungal agents are under development which may have more advantages over current drugs when it comes to overcoming antifungal resistance and ensuring safety. Candida species isolated from clinical samples should be identified and tested for antifungal susceptibility since susceptibility differs between species.

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1. Associate Professor, Department of Microbiology, T.S Misra Medical College and Hospital, Lucknow, Uttar Pradesh, India. 2. Assistant Professor, Department of Microbiology, T.S Misra Medical College and Hospital, Lucknow, Uttar Pradesh, India. 3. Assistant Professor, Department of Microbiology, T.S Misra Medical College and Hospital, Lucknow, Uttar Pradesh, India.
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