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# Determine the Prevalence of Candida Isolates from Urine of Patients Reporting to UOL Teaching Hospital

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**ABSTRACT**

**Background:** Worldwide, urinary tract infection is found most common problem caused by microbial invasion to different tissues of urinary tract. There has been a marked increase in fungal infections involving the urinary tract, of which candida species are the most prevalent. **Objective:** To determine the prevalence of candida isolates from urine of patients reporting to UOL teaching hospital. **Methods:** A cross-sectional study was carried out from 1st of January 2015 till June 2020 among 4069 urine cultures of patients aged 18 years and above of either gender. Urine samples were taken in a sterilized container and were cultured using standard techniques. Candida isolates were identified by Lactophenol blue wet films and Gram stain. SPSS-17 was used for statistical analysis. Descriptive statistics were calculated and chi-square test was applied to see the associations. **Results:** Among 406 patients, 37.6% were male and 62.4% were female. Female patients revealed higher incidence of candida speciesin urine (7%) than that of male patients (3.2%) while there was no difference of Candida species isolations among ward and outdoor female (7.4% and 6.3%) and male patients (3.3% and 3%). The results shows significant association of urine culture result with gender, age and setting among patient <2 years. **Conclusion:** Urinary tract infections caused by *Candida* species were often encountered in both out-patients and in-patients in this study. Females were more commonly affected than males.

## INTRODUCTION:

Worldwide, urinary tract infection is found most common problem caused by microbial invasion to different tissues of urinary tract.[1] Gender, diabetes, hypertension, genetic predisposition, behavioral factors, urologic structural abnormalities, immune-suppression, pregnancy, stone formation, nosocomial acquired infections and instrumentation are known as most predisposing factors of UTIs.[2-5] There has been a marked increase in opportunistic fungal infections involving the urinary tract, of which candida species are the most prevalent.[6]

Candida is the one of most common opportunistic fungal infection, responsible for 90% of vaginitis infectious.[7,8] Incidence of lower urinary tract infections caused by yeasts is fourfold more common in women than in men.[9-11] Multiple studies indicate that at least 10 to 15 percent of hospital acquired UTIs are caused by candida species.[12-17] All common Candida species are capable of causing urinary tract infections. Candida species in measurable quantities in the urine are found in 1% of clean voided specimens in healthy persons while account for 5% of all urine culture results in the general hospital setting and 10% of urine isolates in tertiary care facilities.[6]

Most UTIs due to candida occurs in hospitalized patients with indwelling bladder catheters.[13,18-19] Within the hospital setting, candida is especially common in intensive care units (ICUs) and may represent the most frequent UTIs encountered in adult surgical ICUs.[13,18,19]

A study from Spain reported 22% of critically ill patients, hospitalized for more than 7 days in an ICU developed candida.[19] While study from France reported mean incidence of candida as 27.4/1000 among ICU admissions.[15] 25,000 cases per year was estimated by shay and miller while approx one-third of hospitalized patients with urine cultures yielding candida were in the ICU where bladder catheter use was high.[17] Overall percentage of nosocomial UTIs among catheterized individuals was as high as 37%, of whom 16.4% had infections due to candida species.[20]

Best to our knowledge there have been very few studies on candida isolates in the asian population in general, and in the Pakistani population in particular. The aim of the present study is to reveal the prevalence of candida isolates from urine of patients reporting to UOL teaching hospital.

## MATERIAL AND METHOD:

This cross-sectional study was carried out from 1st of January 2015 till June 2020 among 406 sample of patients aged 18 years and above of either gender reported and or admitted to Hospital, for urinary complaints and advised urine for culture. This study was conducted after approval of hospital ethical review committee. Written and verbal informed consent was taken from the patient. Urine samples were taken in a sterilized container and were cultured quantitatively on CYSTINE LACTOSE ELECTROLYTE DEFICIENT (CLED) and blood agar using standard techniques. *Candida* isolates were identified by Lactophenol blue wet films and Gram stain.

Data was analyzed by using statistical package for social sciences (SPSS) version 17. Mean and standard deviation were computed for quantitative variable and frequency and percentage were calculated for qualitative variables. Stratification was done and post-stratification chi-square test was applied to check association between variables. P value $\leq 0.05$ were considered as significant for all analysis.

## RESULTS:

Among 406 patients, 152 were male and 254 were female. For 254 female patients, 147 urine samples were collected from ward and 107 urine samples were collected from outdoor. For 152 male patients 93 urine samples were collected from ward and 59 urine samples were collected from outdoor. Among total study cases, 244 were aged $< 2$ years and 162 were aged $\geq 2$ years. Most of patients (59.3%) were from Wards. Positive urine culture were found for 226 of patients as presented in Table-1.

**Table No. 1: Descriptive statistics of Study Population**

| | | n(%) |
|---|---|---|
| **Gender** | | |
| Male | | 152(37.6) |
| Female | | 254(62.4) |
| **Age Group** | | |
| <2 years | | 244(60) |
| ≥2 years | | 162(40) |
| **Setting** | | |
| OPD | | 165(40.7) |
| Ward | | 241(59.3) |
| **Urine Culture Result** | | |
| Positive | | 226(79) |
| Negative | | 180(94.4) |

Female patients revealed higher incidence of *Candida* speciesin urine (7%) than that of male patients (3.2%). There was no difference of *Candida* species isolations among ward and outdoor female (7.4% and 6.3%) and male patients (3.3% and 3%). The results also showed significant association of urine culture result with gender (p=0.000), age (p=0.022), and setting among patient with age <2 years (p=0.008). Detailed results are presented in Table-2.

**Table No. 2: Association of Urine Culture Result with other factors**

| | n(%) | | P-Value |
|---|---|---|---|
| | **Positive** | **Negative** | |
| **Gender** | | | |
| Male | 49(3.2) | 148(96.8) | 0.000 |
| Female | 177(7) | 63(93) | |
| **Age Group** | | | |
| <2 years | 152(6.2) | 89(93.8) | 0.022 |
| ≥2 years | 74(4.5) | 155(95.5) | |
| **Setting** | | | |
| Admitted | 141(5.8) | 227(94.2) | 0.331 |
| OPD | 85(5.1) | 157(94.9) | |
| **Setting For Male** | | | |
| Admitted | 31(3.3) | 90(96.7) | 0.765 |
| OPD | 18(3) | 57(97) | |
| **Setting For Female** | | | |
| Admitted | 110(7.4) | 136(92.6) | 0.264 |
| OPD | 67(6.3) | 99(93.7) | |
| **Setting for <2 years** | | | |
| Admitted | 90(6.9) | 120(93.1) | 0.008 |
| OPD | 51(4.5) | 109(95.5) | |
| **Setting for ≥2 years** | | | |
| Admitted | 51(4.6) | 106(95.4) | 0.077 |
| OPD | 34(6.7) | 47(93.3) | |
| Chi-Square Test was applied. | | | |
| P≤0.05, considered as significant. | | | |

**DISCUSSION:**

Urinary tract fungal infections caused by *Candida* species are becoming most common and important problem over the past decades.[21] Among urinary tract infections, *Candida* ranked as seventh among all nosocomial pathogens and fourth among nosocomial pathogens of.[22] Candidia is often diagnosed on the basis of clinical features alone as well as with other conditions.[23,24] The rate of misdiagnosed vulvovaginal candidia on clinical presentation alone is high and can be wrongly subjected to treatment.[24]

In our study, total of 4069 urine samples from patients were received, out of which 5.6% urine samples were found positive for candida which in nearly same to study reported by Ali JA et al[7] while is lower than the 13.27% reported for candidia by Fernandez-Limia et al.[25]

In current study, 53% of the patients were females while 43% were males and the female-to-male ratio was 1.66:1. The results of the present study also showed a higher prevalence of Candida in females 7% than in males 3.2% which is similar to results reported by other studies.[26-29,30] This high incidence in females may reflect vaginal candidia.

Age is considered as a risk factor in most of the studies from the developed world, where people are more conscious of health factors and diets.[6,27] Contrary to that, in the developing world, majority of the individuals are immunodeficient and prone to infections because of their poor nutritional status. This could play a major role in infections due to Candida species in either gender or all age groups. Current study found candida among 6.2% of patients with age <2 years and 4.5% of patients with age ≥2 years.

Candidia prevalence was 5.8% among ward patients and 5.1% among OPD patients. There was no statistically significant difference between the in-patients and out-patients. Other studies have shown higher incidence of Candidia among in-patients.[6,27] In this study, frequency of candidia among in-patients has shown a rising trend. This trend could be explained by a high incidence of risk factors like renal failure, diabetes, recurrent urinary tract infections, indiscriminate use of antibiotics, bed-ridden patients etc. in the community as studied by Colodner *et al*.[31] Some authors suggests that the presence of funguria, especially in-patients in intensive care unit, might be indicative of systemic infection; whereas, others have noted the benign nature of funguria in many adults.[6,27]

**Study limitation:**

The study has certain limitations, like small sample size. Other cases were those which presented to a public sector hospital, thus cases from private sector were not included and also the sample cannot represent the entire population of the community overall.

## CONCLUSION:

Urinary tract infections caused by Candida species were often encountered in both out-patients and in-patients in this study. Females were more commonly affected than males. Considering the changing pattern of the disease, it has become important to monitor infections of urinary tract as the management would depend on the isolates.

## DISCLOSURE OF INTEREST

The authors declare that they have no conflicts of interest concerning this article.

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