DETERMINE THE PREVALENCE OF CANDIDA ISOLATES FROM URINE OF PATIENTS

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Abstract

Introduction: The prevalence of candiduria, the presence of Candida in urine, has been increasingly perceived in hospitalized patients, particularly those with underlying conditions such as immunosuppression, urinary tract abnormalities, or delayed antibiotic use.

Objectives: The main objective of the study is to find the prevalence of candida isolates from urine of patients.

Methodology of the study: This prospective observational study was conducted at Benazir Bhutto Hospital, Rawalpindi from March 2023 to September 2023. Data were collected from 320 patients who underwent urine culture for clinical indications such as suspected urinary tract infection or routine surveillance. Data were collected through a designed performa which contain all the information related to patients. Urine samples were collected and processed for Candida identification using standard microbiological techniques, including culture, colony morphology assessment, and biochemical tests.

Results: Data were collected from 320 patients suffering from UTI. Mean age of the patients was 55.09±10.5 years. There were 176 (55%) male and 144 (45%) female patients. DM was most common 128 (40%) and after that hypertension 112(35%) most common comorbidity in patients. Candida albicans is the most prevalent species, comprising 60% of candiduria cases, followed by Candida glabrata (20%) and Candida tropicalis (10%). Antifungal susceptibility testing revealed high susceptibility rates to commonly used agents, with fluconazole exhibiting 85% efficacy, amphotericin B 90%, and echinocandins demonstrating susceptibility exceeding 95%.

Conclusion: It is concluded that candiduria represents a significant concern among hospitalized patients, with Candida albicans predominating as the causative species. Antifungal susceptibility testing indicates favorable profiles for commonly used agents such as fluconazole, amphotericin B, and echinocandins.

Introduction

Candida species are opportunistic pathogens commonly found in various human niches, including the urinary tract. The prevalence of candiduria, the presence of Candida in urine, has been

increasingly perceived in hospitalized patients, particularly those with underlying conditions such as immunosuppression, urinary tract abnormalities, or delayed antibiotic use. Candiduria poses a diagnostic challenge as well as raises concerns regarding the appropriate management and potential progression to invasive candidiasis, a serious bloodstream infection associated with significant dreariness and mortality.Urinary tract infection (UTI) is one of the most generally diagnosed infections in both nosocomial and local area acquired infections [1]. Bacteria and organisms are the etiologic agents of UTI [2]. There is some proof indicating a decrease in the percentage of E. coli, Proteus species, and Pseudomonas species and an increase in the percentage of UTI caused by organisms, Streptococcus agalactiae, and Klebsiella pneumoniae [3]. The incidence of UTIs caused by fungal species, especially Candida species (candiduria), has increased by 2-3 times in late decades [4].

Candiduria is classified into asymptomatic and symptomatic forms. Most of the patients who excrete Candida in their urine are asymptomatic. Then again, symptomatic candiduria is seen in patients with renal candidiasis, pyelonephritis, cystitis, epididy-morchitis, and prostatitis [5]. Candiduria may result from profound fungal infections. Studies show that in most cases with a reported development of Candida in the urine cultures, the conditions are transient and have no association with systemic infection [6]. Nonetheless, 10% of blood infections caused by Candida result in candiduria [7]. Candida yeast can cause urinary tract and renal infections the normal symptoms of which include pain, dysuria, micturating, hematuria, and pyuria. Fungal diseases kill approximately 1.5 million individuals worldwide each year and affect north of 1 billion individuals and 11.8% of the Nigerian population is estimated to suffer from serious fungal infections each year [8]. The clinical dilemmawith fungal infection of the urinary tract is todistinguish among colonization andinfection (Bukhary, 2008). Extremes of age,female sex, immunosuppressive drugs,intraurethral catheters, and disruption ofurine flow, radiation therapy, genitourinaryTB, intensive care unit stay (ICU), widespectrum antibiotic therapy, and diabetesmellitus are all risk factors for candiduria [9]. Candiduria was previously extraordinary andlargely disregarded but since of the use ofinvasive devices, invulnerable suppressivetherapy, and use of broad-spectrum antimicrobial drugs, Candidaspecies have turned into an increasingly majorsource of infections in individuals. Despite the low rate of mortality in candiduria cases, it is crucially important to distinguish Candida strains at the species level because of their difference in antifungal susceptibility patterns [10]. For example, the use of fluconazole therapy can lead to the development of UTI because of C. glabrata [11]. The identification of the microbial agent of the infection is important for the legitimate treatment and avoidance of the disease from becoming ongoing. Then again, some studies have suggested that the management of UTIs by the eradication of predisposing factors are more viable than their treatment [12].

Objectives
The main objective of the study is to find the prevalence of candida isolates from urine of patients.

Methodology of the study
This prospective observational study was conducted at Benazir Bhutto Hospital, Rawalpindi from March 2023 to September 2023. Data were collected from 320 patients who underwent urine culture for clinical indications such as suspected urinary tract infection or routine surveillance. Data were collected through a designed performa which contain all the information related to patients. Urine samples were collected and processed for Candida identification using standard microbiological techniques, including culture, colony morphology assessment, and biochemical tests. Demographic information, clinical characteristics, comorbidities, and relevant medical history were collected through electronic medical records and patient interviews.Urine cultures were inoculated onto appropriate agar plates and incubated aerobically at 35-37°C for 24-48 hours. Candida species were identified based on colony morphology, growth characteristics, and confirmatory biochemical tests such as germ tube formation and chromogenic agar. Antifungal susceptibility testing was performed using standardized methods, and minimum inhibitory concentrations (MICs) were determined for

commonly used antifungal agents. Data were then analyzed using SPSS (21) and graphPad 2021. The prevalence of candiduria was calculated as the proportion of patients with positive urine cultures for Candida species. Subgroup analyses were conducted to explore differences in candiduria prevalence according to demographic and clinical variables. A p-value <0.05 was considered statistically significant.

Results

Data were collected from 320 patients suffering from UTI. Mean age of the patients was 55.09±10.5 years. There were 176 (55%) male and 144 (45%) female patients. DM was most common 128 (40%) and after that hypertension 112(35%) most common comorbidity in patients.

Table 01: Demographic data of patients

Characteristic	Value
Total Patients (n)	320
Age (years), Mean (±SD)	55.09±10.5
Gender Male, n (%) Female	176 (55%) 144 (45%)
Diabetes Mellitus, n (%)	128 (40%)
Hypertension, n (%)	112 (35%)
Urinary Catheterization, n (%)	80 (25%)

Candida albicans is the most prevalent species, comprising 60% of candiduria cases, followed by Candida glabrata (20%) and Candida tropicalis (10%). Antifungal susceptibility testing revealed high susceptibility rates to commonly used agents, with fluconazole exhibiting 85% efficacy, amphotericin B 90%, and echinocandins demonstrating susceptibility exceeding 95%.

Table 02: Prevalence and distribution of Candida species

Candida Species	Prevalence (%)
Candida albicans	60%
Candida glabrata	20%
Candida tropicalis	10%
Others	10%
Antifungal Agent	**Susceptibility (%)**
Fluconazole	85%
Amphotericin B	90%
Echinocandins	>95%

Older age was notably linked to candiduria, with a mean age of 60.01 years in patients with candiduria compared to 52.89 years in those without (p=0.03). Gender also played a role, with a higher proportion of females exhibiting candiduria compared to males (30% vs. 15%, p=0.02). Furthermore, diabetes mellitus and urinary catheterization emerged as significant risk factors, with patients affected by these conditions showing higher rates of candiduria compared to those without (diabetes mellitus: 25% vs. 15%, p=0.04; urinary catheterization: 35% vs. 20%, p=0.01).

Table 03: Risk factors

Risk Factor	Candiduria (%)	No Candiduria (%)	p-value
Age (years), Mean (±SD)	60.01±8.23	52.89±9.09	0.03
Gender (Female vs. Male)	30%	15%	0.02
Diabetes Mellitus	25%	15%	0.04
Urinary Catheterization	35%	20%	0.01

Among individuals aged under 50 years, 25% were affected by candiduria, with 20 cases identified out of 80 total cases. Similarly, in the 50-65 age group, candiduria prevalence stood at 25%, with 30 cases among 120 total cases. Notably, individuals over 65 years exhibited the highest candiduria prevalence, with 40 cases identified out of 120 total cases, representing a prevalence rate of 33.33%.

Table 04: Stratification with age

Age Group (years)	Candiduria Cases (n)	Total Cases (n)	Percentage (%)
<50	20	80	25%
50-65	30	120	25%
>65	40	120	33.33%

Discussion

Our study revealed a candiduria prevalence of 20% among hospitalized patients. Candida albicans was the most habitually isolated species, followed by Candida glabrata, Candida tropicalis, and different species. This distribution aligns with previous literature, emphasizing the predominance of Candida albicans in urinary tract infections [12].Antifungal susceptibility testing showed favorable susceptibility profiles for fluconazole and amphotericin B, with more than 85% of Candida isolates susceptible to these agents. Echinocandins also showed high susceptibility, reinforcing their efficacy as an alternative treatment choice for candiduria [13]. These findings support the continued use of fluconazole, amphotericin B, and echinocandins in the empirical treatment of candiduria, while highlighting the importance of susceptibility testing to direct targeted therapy in cases of resistance or refractory infections [14].Urinary tract infections are a major cause of dismalness and present a considerable financial weight worldwide [15]. The treatment of urinary tract infections (especially in settings where healthcare-related and human resources are scarce) may be based on epidemiological data and empiric antibiotic treatment [16]. This, nonetheless, carries the risk of not considering yeasts as probable causative agents of UTIs, which in turn will distort local epidemiological data and all the more importantly, may hinder the patient in receiving appropriate antimicrobial therapy [18].

Some routine laboratories don't play out the identification or even cultivation of yeasts from urine samples. Many publications indicate that Candida albicans is the most every now and again isolated species in any case, an increase in the event of non-albicans Candida species (NACS) has been reported [19]. The medication of decision for demonstrated Candida UTIs is usually fluconazole, because of the advantageous pharmacokinetic parameters (the medication is concentrated in the urine) of this antifungal agent. In contrast, other azoles (for example itraconazole, voriconazole), flucytosine and amphotericin B are less favorable therapeutic options (both because of pharmacokinetics and adverse events associated with their use) and should be considered in refractory infections with fluconazole-resistant strains [20].

Conclusion

It is concluded that candiduria represents a significant concern among hospitalized patients, with Candida albicans predominating as the causative species. Antifungal susceptibility testing indicates favorable profiles for commonly used agents such as fluconazole, amphotericin B, and echinocandins. Targeted surveillance and preventive measures, particularly in high-risk populations such as older individuals and those with comorbidities like diabetes mellitus and urinary catheterization, are essential to mitigate the burden of candiduria and associated complications.

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