



Frequency of Candiduria in Patients of Different Age Groups in a Tertiary Care Hospital

Isha Shafique¹, Kinza Nadeem¹, Talha Mannan^{*1}, Hina Awais², Madiha Mumtaz¹

¹Department of Medical Lab Technology, Shalamar School of Allied Health Sciences, Lahore, Pakistan.

²University Institute of Medical Lab Technology, The University of Lahore, Lahore, Pakistan.

*Corresponding author: Talha Mannan (tmannan87@gmail.com) (ORCID: 0000-0001-5408-8632).

Abstract

Candida spp. is one of the most important components of human micro ecology. Most of the patients who diagnosed with candiduria do not have any apparent symptoms and it is certainly very difficult to differentiate between bacteriuria and candiduria in symptomatic patients. The main aim of this study to determine the frequency of candiduria in patients of different age groups in a tertiary care hospital. Data of 1805 samples were included in this study, which were received in Microbiology Lab of Shalamar hospital Lahore, during one year (31st January 2021 to 31st January 2022). The data of candiduria patients were collected which diagnosed on the basis of microscopic examination and cultural identification were further analyzed through SPSS 25.0. In this observational study, out of 1805 patients, 23% were positive for bacterial growth while 3.7% were positive for fungal growth (*Candida*) and remaining 1320 were showed negative results. The frequency of candiduria in different age groups were found as, Infants 0-1 year 4.9% followed by; teen 13-19 years 1.4%, adult 20-39 years 1.8%, middle age adults 40-59 years 3.8% and elder above 60 years 6.4%. According to our observation candiduria is more often in females than in males and the elder patients were more prone for *Candida* infection. So, we recommended that regular follow-up of elderly patients is required for the diagnosis of candiduria either they are symptomatic or not. **Keywords:** *Candida*, Candidiuria, Elderly patients, Fungal growth, Urinary Tract Infections.

Article Info:

Received:

July 31, 2023

Received Revised:

September 22, 2023

Accepted:

September 25, 2023

Available online:

November 1, 2023

*Corresponding Author:

aqilal@sa.edu.pk

1. INTRODUCTION

Candida albican and non-*C. albican* spp. are considered important parts of microbial normal flora in the oral cavity, alimentary canal and vagina in a vast range of the healthy people. Immune deficiencies may lead to an imbalance between *C. albicans*, non-*C. albicans* yeasts and the other host normal flora. In this condition, the commensal yeasts of *Candida* may convert into opportunistic pathogenic microorganism¹. Infections caused by *Candida* include vaginitis, oropharyngeal candidiasis, cutaneous candidiasis, candiduria, candidemia, candidal urinary tract infections and disseminated systemic infections². Their virulence factors

such as dimorphism, phenotypic switching, and hydrolytic enzymes have crucial role in colonization and incursion of urinary tract system³. Virulence factors help the organisms to evade host defense mechanisms and also to establish their pathogenicity. Candiduria is the presence of yeast cells in urine⁴ as the manifestation of *Candida spp.* in urine (i.e., candiduria), is a common clinical finding, mainly in hospitalized patients⁵. Candiduria is rarely seen as a community-acquired infection in a structurally normal urinary tract and in healthy people⁴. *Candida* causes Urinary tract infection (UTI) either by hematogenous routes from the bloodstream or ascending routes from a focus of their colonization near the urethra. UTI caused by *Candida* in elderly patients is becoming more common with atypical signs and symptoms⁶. The risk factors of candiduria in the females are extremes of age, diabetes mellitus, prolonged hospitalization, recent use of broad-spectrum antibiotics or immunosuppressant⁵. Based on previous studies, *Candida* infection occurs more often in females as compared to males, with a ratio of 8:1⁷. Antifungal therapy is used to treat the candiduria such as Fluconazole is the main drug which is used for its efficacy and least complications⁸. So this project was designed to check out the prevalence rate of candiduria among patients of different age groups in a tertiary care hospital.

2. MATERIALS AND METHODS

2.1 Study Setting

This retrospective cohort study was conducted at Shalamar Hospital Lahore, Pakistan from January 2021 to January 2022. The study was permitted by the Institutional Ethics Committee (SSAHS-IRB/AL/43/2022) and was in accordance with the declaration of World Medical Association (WMA) made at Helsinki.

2.2 Data Collection

On the basis of the Non-probability purposive sampling technique we collected the data of 1805 patients on the basis of designed performa in which following parameters were included: gender, age, microscopic identification on urine routine examination (pus cells, budding yeast cell and fungal hyphae) and identification of organism on culture. Patients who presented with the signs and symptoms of urinary tract infections, bladder discomfort, painful or difficulty in micturition and fever were included in this study but the Patients with bacterial UTI were excluded from this study. Only the data of those patients were included in this research work which were isolated and confirmed for the presence of the *candida* in patient's sample on the Cysteine lactose dextrose electrolyte deficient Agar (CLED), Sabouraud dextrose agar (SDA) and through Combur urine test strip.

2.3 Statistical Analysis

The data was entered and analyzed by using SPSS 25.0 and to determine the association of candiduria with age, gender & pus cells through chi square test as p-value of 0.05 or less was considered as significant.

3. RESULTS AND DISCUSSIONS

Urinary tract infections (UTIs) are the most common nosocomial infections among the hospitalized patients and their incidence has considerably increased during the recent decades. Several microorganisms are associated with UTIs including, bacteria, viruses, filamentous and yeasts fungi, however 10–15% of them are caused by *Candida spp.*, and has resulted in increased rate of mortality⁹. Candiduria is rare in healthy people but relatively frequent in hospitalized patients¹⁰.

Out of 1805 patients 424 (23%) were positive for bacterial growth while 61(3.7%) were positive for fungal growth (*candida*) and remaining 1320 were showed negative results for both fungal and bacterial growth. In 61 *candida* positive patients 33 were female and 28 were male. We distributed our data between different age groups and the frequency of candiduria were found as, Infants 0-1 year (4.9%) followed by; teen13-19 years (1.4%), adult 20-39 years (1.8%), middle age adults 40-59 years (3.8%) and elder & >60 years (6.4%). While in patient with positive bacterial growth, out of 424 patients 304 were female and 120 were male. Total four patients were positive for both bacterial and fungal growth in which two were female and two were male. There was an association between *candida* spp. and age group (p value < 0.001). The positive cases according to the different age groups were as follow in table 1: According to this data, the most prevalent age group was Elder >60 (9.7%). The present study is in covenant with many similar studies like according to Tandogdu and his colleague who worked on UTI in 2016 and gave the prevalence of UTI19.6% and 24% respectively¹¹. However, one study conducted in Nigeria has documented an overall prevalence of urinary tract infection in the area as (39.69%)¹². The isolation rate

of *Candida spp.* as uropathogen was (3.4%) in our study which was in agreement with some similar studies conducted in different areas. A study which was conducted in Mangalore has documented the isolation rate of *Candida* as (2.27%)¹³.

Table 1: Frequency of *candida* spp. in different age group.

Age group	<i>Candida</i> spp.		
	No	Yes	Total
Infant	91 (93.8%)	6 (6.2%)	97(100.0%)
Toddler	86 (100.0%)	0 (0.0%)	86(100.0%)
Child	207 (99.5%)	1 (0.5%)	208(100.0%)
Teen	61 (98.4%)	1 (1.6%)	62(100.0%)
Young Adult	355 (97.8%)	8 (2.2%)	363(100.0%)
Middle Age Adult	268 (95.0%)	14 (5.0%)	282(100.0%)
Elder	251 (90.3%)	27 (9.7%)	278(100.0%)
Total	1319 (95.9%)	57 (4.1%)	1376(100.0%)

Likelihood Ratio 41.204

On the basis of microscopic examination of patient's urine samples, among the 61 *Candida* positive samples 39.3% patients showed no pus cells however, 60.6% urine samples presented pus cells under microscopic observations (Fig 1).

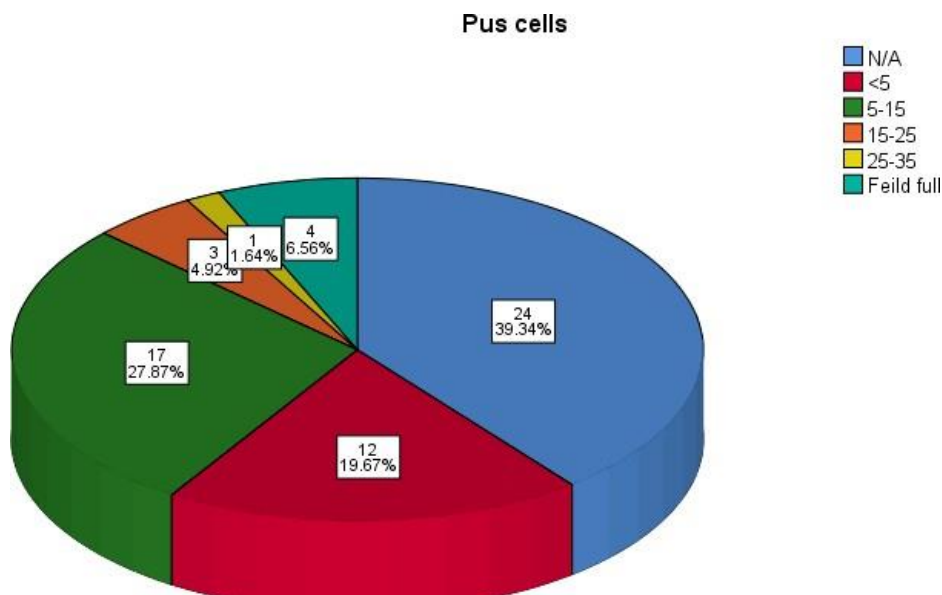


Fig 1: Pie chart shows frequency of pus cells in *Candida* positive cases.

While on the basis of chemical examination out of total 61 *Candida* positive patients only 21.3% patients showed +++ glucose in their urine while 68.9% patients were negative for glucose, 1.6% have trace amount, 4.9% showed + and 3.3% patients showed ++ glucose concentration. There was no

association between glucose and age group (p-value 0.646) because out of 61 *Candida* positive patients the infants (14.3%), Young adults (12.5%) and elder (3.3%) have + glucose concentration while ++ glucose concentration was showed in middle age adult group (7.1%) and elder group (3.3%) as well as if we talk about the +++ glucose concentration which were present in infants(14.3%), teen (100.0%), middle age adult (21.4%) and elder groups (26.7%) as shown in fig 2.

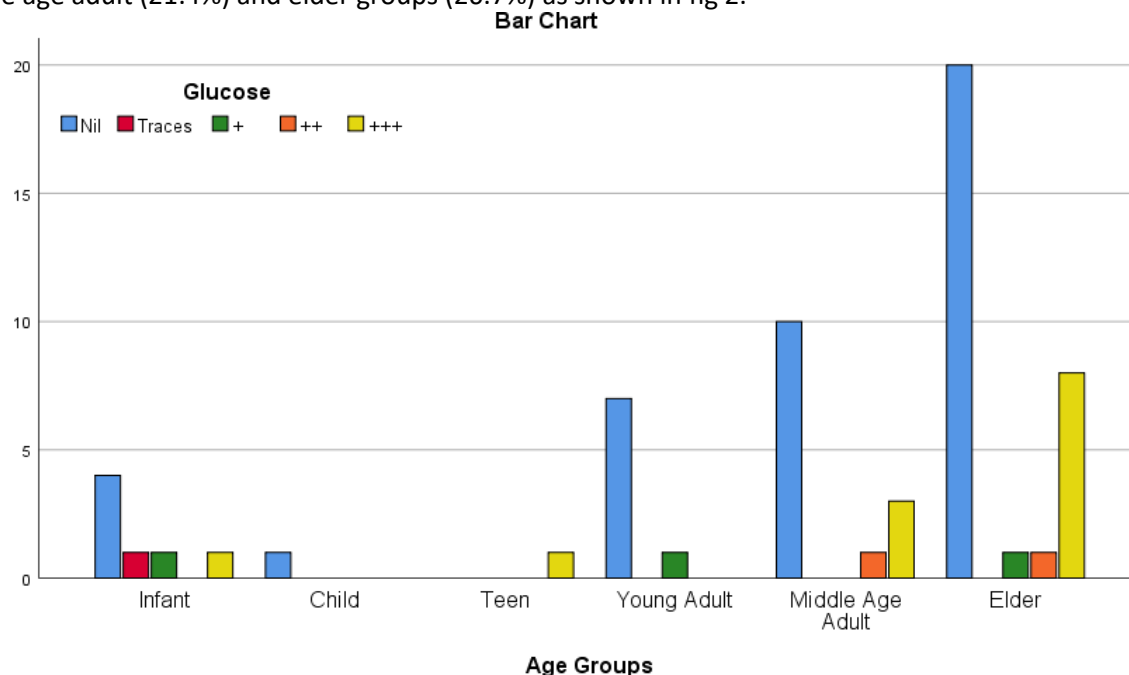


Fig 2: Bar chart shows presence of glucose in different age group.

In our study, the incidence of *Candida* UTI was more in females (54%) than males (45.9%) which was consistent with the previous studies^{14,9}. Higher prevalence of UTI among females was high due to various factors that predispose woman to UTI and females have the increase rate of UTIs due to the proximity of anus to urethra and shorter length of urethra and microbial niches which support the easy entry of uropathogens from surrounding to the urinary tract. However, in some other studies there was no significant difference of *Candida* UTI between male and female were reported¹⁵.

The age group > 60 was most frequently (9.7%) affected which was also agreed with other previously reported studies¹⁶. The incidence of *Candida* UTI in elders might be a result of genitourinary atrophy and vaginal prolapse after menopause that alters the vaginal pH. In our study pus cells were seen in the microscopic examination of 57.8% cases which was high as compared to study held in Iraq, however they determined the frequency about 84% which was close to our results¹⁷. According to previous study the prevalence of candiduria in diabetic patients was 8.3% and similar findings have been reported in Pakistan (10.2%) as well as in Saudi Arabia (8%) but in our study the prevalence of *Candida* positive patients with glycosuria was (21.3%)¹⁸.

4. CONCLUSIONS

According to our study it is concluded that the chances of occurrence of Candiduria is more often in females than in males and the elder patients were more prone for *Candida* infection. Our research work predicts that there is no significant correlation between glucose with age group and glucose with candiduria. A regular follow-up of elderly patients must be required for the diagnosis of candiduria either they are symptomatic or not.

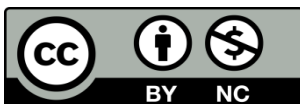
CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Fisher JF, Kavanagh K, Sobel JD, Kauffman CA, Newman CA. *Candida* urinary tract infection: pathogenesis. *Clinical Infectious Diseases*. 2011;52:437-51.

2. Mba I, Nweze E. The use of nanoparticles as alternative therapeutic agents against *Candida* infections: an up-to-date overview and future perspectives. *Journal of Biotechnology*. 2020; 36:1-20.
3. Fazeli A, Kordbacheh P, Nazari A, Ghazvini RD, Mirhendi H, Safara M, Bakhshi H, Yaghoubi R. Candiduria in hospitalized patients and identification of isolated *Candida* spp. by morphological and molecular methods in Ilam, Iran. *Iranian journal of public health*. 2019; 48:156.
4. Pramodhini S, Srirangaraj S, Easow JM. Candiduria A Study of Virulence Factors and Its Antifungal Susceptibility Pattern in Tertiary Care Hospital. *Journal of Laboratory Physicians*. 2021;13: 231-237.
5. Gajdács M, Dóczy I, Ábrók M, Lázár A, Burián K. Epidemiology of candiduria and *Candida* urinary tract infections in inpatients and outpatients: results from a 10-year retrospective survey. *Central European journal of urology*. 2019; 72:209.
6. Kim SJ, Ryu JH, Kim YB, Yang SO. Management of *Candida* urinary tract infection in the elderly. *Urogenital Tract Infection*. 2019; 14:33-41.
7. Aghili SR, Abastabar M, Soleimani A, Haghani I, Azizi S. High prevalence of asymptomatic nosocomial candiduria due to *Candida glabrata* among hospitalized patients with heart failure: a matter of some concern?. *Current Medical Mycology*. 2020;6:1-8.
8. Alfouzan W, Dhar R. Candiduria: evidence-based approach to management, are we there yet? *Journal of Medical Mycology*. 2017; 27: 293-302.
9. Gharaghani M, Taghipour S, Halvaezadeh M, Mahmoudabadi A. Candiduria; a review article with specific data from Iran. *Turkish journal of urology*. 2018; 44: 445.
10. Marak MB, Dhanashree B. Antifungal susceptibility and biofilm production of *Candida* spp. isolated from clinical samples. *International Journal of Microbiology*. 2018; 10: 1-5.
11. Tandogdu Z, Wagenlehner FM. Global epidemiology of urinary tract infections. *Current opinion in infectious diseases*. 2016; 29:73-79.
12. Oladeinde BH, Omoregie R, Olley M, Anunibe JA. Urinary tract infection in a rural community of Nigeria. *North American journal of medical sciences*. 2011;3: 75.
13. Yashavanth R, Shiju M, Bhaskar U, Ronald R, Anita K. Candiduria: prevalence and trends in antifungal susceptibility in a tertiary care hospital of Mangalore. *Journal of Clinical and Diagnostic Research*. 2013;7:2459.
14. Esmailzadeh A, Zarrinfar H, Fata A, Sen T. High prevalence of candiduria due to non- albicans *Candida* spp. among diabetic patients: A matter of concern? *Journal of clinical laboratory analysis*. 2018; 32:4
15. Guleret S, Ural O, Findik D, Arslan U. Risk factors for nosocomial candiduria. *Saudi medical journal*.2006; 27: 1706.
16. García-Agudo L, Rodríguez M, Carranza GR. Nosocomial candiduria in the elderly: microbiological diagnosis. *Mycopathologia*. 2018; 13: 591-596.
17. AlDuboon AH. Candiduria and urinary candidiasis in Basrah, Iraq. *Journal of Basrah Researches*.2010; 36:1-12
18. Yismaw, G., Asrat, D., Woldeamanuel, Y. & Unakal, C. Prevalence of candiduria in diabetic patients attending Gondar University Hospital, Gondar, Ethiopia. *Iranian journal of kidney diseases*.2013;7:102.



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License. To read the copy of this license please visit: <https://creativecommons.org/licenses/by-nc/4.0/>