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Fungal profile of funguria cases at a tertiary care hospital in southern India

Surumy P. Sulaiman, Rakesh Singh & Jharna Mandal

Department of Microbiology, Jawaharlal Institute of Postgraduate Medical Education & Research Puducherry, India

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***Background & objectives*: *Candida albicans* is the most common aetiological agent in funguria cases commonly observed in hospitalized patients. But a few reports are available from India where non-albicans *Candida* species have accounted for >50 per cent of urinary *Candida* isolates. We undertook this study to know the fungal profile amongst funguria cases.**

***Methods*: A total of 123 consecutive fungal isolates obtained from clinically suspected cases of urinary tract infection from April to September, 2013, were included. Yeast species was identified by standard phenotypic methods. Antifungal susceptibility testing of yeast was performed for fluconazole (25 µg) by disc diffusion method as per Clinical and Laboratory Standards Institute (CLSI) guidelines.**

***Results*: The male to female ratio was 0.92. The mean age of patients was 42.7 ± 18.9 yr. *C. tropicalis* (58.5%) was the most common fungal agent followed by *C. albicans* (30.1%). Only one isolate of *C. tropicalis* was resistant to fluconazole.**

***Interpretation & conclusions*: *C. tropicalis* and *C. albicans* were the predominant fungal pathogens responsible for urinary tract infection. Less resistance to fluconazole observed in the study may be due to restricted use of fluconazole in this area.**

Key words *Candida* - candiduria - funguria - urinary tract infection

The presence of fungus in urine or funguria is a common finding at a tertiary care hospital. Candiduria is observed in 16-22 per cent of hospitalized patients[1,2]. The common risk factors for funguria are female sex, extremes of age, intensive care unit (ICU) admission, urinary catheterization, diabetes mellitus, and broad-spectrum antibiotic therapy[1-4]. Though *Candida albicans* is the most common aetiological agent[1,2,4,5], but reports are available where non-albicans *Candida* species accounted for > 50 per cent of urinary *Candida* isolates[3,6]. These include *C. tropicalis*, *C. glabrata, C. parapsilosis* and *C. krusei*[1,3,4,6]. It is important to identify the species of *Candida* in such cases as different species have different antifungal susceptibility, for example *C. krusei* is known to be inherently resistant to fluconazole[7]. There is a paucity of literature on fungal profile in funguria cases especially from our country. Hence, this study was undertaken to know the

fungal profile amongst funguria cases and to know the antifungal susceptibility status at a tertiary care hospital in southern India.

Material & Methods

All consecutive 123 fungal isolates obtained from urine specimens received from clinically suspected cases of urinary tract infection at the Department of Microbiology, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry from April to September, 2013, were included in the study. Associated underlying conditions were recorded. Presence of pus cells and yeast cells in microscopic examination of uncentrifuged urine samples was also recorded. Yeast species was identified by combination of germ tube, CHROM agar (Hi-Media, Mumbai) and morphology on corn meal agar methods containing 1 per cent tween 80[1,8-10]. Antifungal susceptibility testing of yeast was performed for fluconazole (25 µg) by disc diffusion method as per Clinical and Laboratory Standards Institute (CLSI) guidelines[11]. Categorical variables were expressed as frequencies and percentages and continuous variables were expressed as mean with standard deviation. The study protocol was approved by the Institute Ethics Committee.

Results & Discussion

Of the 123 fungal isolates, 64 (52%) were obtained from female patients. The male to female ratio was 0.92. The mean age was 42.7 ± 18.9 yr. An age-wise distribution of funguria cases is shown in the Figure. Maximum cases of funguria were seen in 21-30 and 51-60 yr age group.

Common underlying conditions were ICU admission (17.9%), surgical procedures (9.8%) and diabetes mellitus (6.5%). Yeast cells were observed in 49 (39.8%) funguria cases. Pus cells per high power field observed in uncentrifuged urine is shown in the Table. Concomitant bacteria were also isolated in 23 (18.7%) funguria cases. *Enterococcus faecalis* was isolated in 11 (8.9%) cases, *Escherichia coli* in 10 (8.1%) cases and *Pseudomonas* spp. in 2 (1.6%) cases. *Candida tropicalis* was the most common fungal isolate (58.5%) followed by *C. albicans* (30.1%). *C. glabrata, C parapsilosis* and *Trichosporon* spp. were found in 3.3 per cent cases each. Single isolate each of *C. krusei* and *C. kefyr* were isolated in this study.

Germ tube test was positive in 38 (29.3%) *Candida* isolates. All germ tube test positive isolates were *C. albicans*. Only one *C. albicans* isolate was germ tube negative. Only one isolate of *C. tropicalis* was observed resistant to fluconazole.

Fungal urinary tract infection or funguria has become an important nosocomial infection over the past decades. About 15 per cent of urinary tract infections are caused by *Candida* spp[1,12,13]. Though funguria is frequently observed in females but a few studies have observed more cases of funguria among males (61.4%)

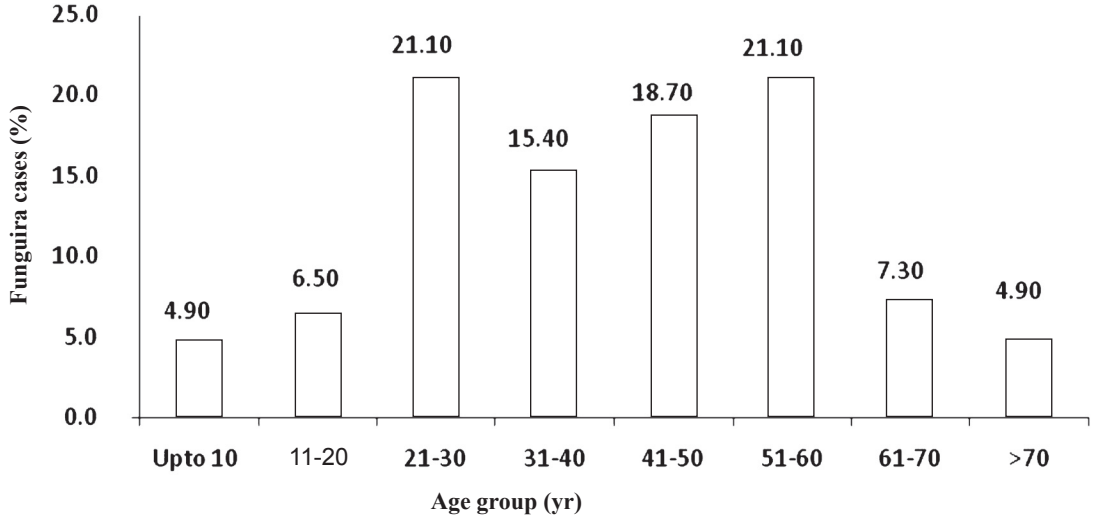

Fig. Age-wise distribution of funguria cases.

Table. Microsopic observation of pus cells in funguria cases (n=123)

Pus cells per high power field in uncentrifuged urine	No. (%) of urine samples
Nil	86 (69.9)
Upto 5	16 (13.0)
6-10	5 (4.1)
11-15	7 (5.7)
16-20	1 (0.8)
21-25	1 (0.8)
More than 25	7 (5.7)

as compared to the females (38.6%) in catheterized ICU patients[3]. The male to female ratio was 0.92 in our study indicating that female cases were marginally more than the male cases. Most of the funguria cases were adults (76.4% were 21-60 yr of age). There were two peaks of funguria cases: one at 21-30 yr and another was 51-60 yr. Elderly people are at higher risk of funguria because of decreased immunity in advance age[3,4].

One of the limitations of the study was that there was no uniformity in recording the associated conditions in requisition proforma. Another limitation was that participants were not followed up for the response to the treatment and outcome.

Pyuria (>5 pus cells/high-power field) was observed only in 17.1 per cent of funguria cases. Hence, funguria was not associated with the presence of pus cells in urine in our study. Presence of pus cell in funguria cases may be due to coexistent bacterial infection or mechanical injury of the bladder mucosa by indwelling urinary catheter. Bacterial co-infection was observed in 18.7 per cent of funguria cases in the current study. *C. tropicalis* was the most common fungal isolate found in urinary tract infection, followed by *C. albicans*. Similar fungal profile has been reported by other studies from India[3,14,15], whereas *C. albicans* was the most common isolate followed by *C. glabrata* from studies done outside India[1,4,16-19]. Single isolate (2.7%) of *C. albicans* in the present study was germ tube negative. Four (3.3%) isolates of *Trichosporon* spp. were isolated in urine specimen which is scarcely reported in literature in funguria cases[19]. Isolation of *Trichosporon* spp. was also reported in a study from Chandigarh, India[6]. Only single isolate of *C. tropicalis* was resistant to fluconazole while 18.6 per cent isolates of *C. tropicalis* were observed to be resistant to fluconazole in another study from India[6]. Less fluconazole resistance observed in our study may be because of restricted use of fluconazole in southern part of India as compared to the northern part.

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Reprint requests: Dr Rakesh Singh, Associate Professor, Department of Microbiology, Jawaharlal Institute of Postgraduate Medical Education & Research, Puducherry 605 006, India
e-mail: drrakesh1976@yahoo.com