

Original Research Article

TITLE: Prevalence of Candiduria in infants from a tertiary care hospital

Abstract:

Yeast related urinary tract infections are rare in healthy newborns. Study was conducted in the department of microbiology, Dr. RML hospital and PGIMER from June 2012 to June 2013. Only infants were included in the study. A total of three hundred and thirty three urine samples were received for fungal culture and microscopy. The isolation rate of candida species amongst the 333 samples was found to be 21.62%. Amongst 333 samples received 37 (11.11%) were positive for candida albicans while 35 (10.51%) were positive for non albicans candida species. So, in this study among 72 isolates of candida, candida albicans was found in 51.39% while non albicans candida species was found to be in 48.61% of the candida isloates. It is important that the specific species responsible for symptomatic infection is identified, given the differences in antimicrobial susceptibility among Candida species.

Keywords: urinary tract infection, candida albicans, non-albicans candida.

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Introduction:

Yeast related urinary tract infections are rare in healthy newborns. In contrast, candiduria occur commonly in neonatal and pediatric ICUs and particularly in premature infants. Spectrum of disease is varying from asymptomatic candiduria to clinical sepsis. Several reports showed that the frequency of urinary tract infection (UTI) due to yeasts has increased during the last decades (1-4). Risk factors for candida infections include prolonged hospitalisation, broad spectrum antibiotic therapy, use of catheter, total parenteral nutrition, renal and urinary tract malformations and prematurity. Although *C. albicans* is frequently reported as the most prevalent species infecting the urinary tract, non-albicans *Candida* species appear better adapted to the urinary tract environment with many studies reporting that >50% of urinary *Candida* isolates belong to non-albicans species. *C. tropicalis*, *C. glabrata*, *C. parapsilosis*, *C. lusitaniae*, *C. guilliermondii* and *C. krusei* are non-albicans species that cause candiduria (5,6). It is important to know the *Candida* spp. causing the UTI before initiating the treatment as many non-albicans *Candida* spp. are inherently resistant to treatment with fluconazole. The aim of the present study was to determine the prevalence of Candiduria in infants and to detect candida albicans and non albicans candida species among candida isolates to help the clinicians in the better management of such cases.

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Materials & Methods:

This study was conducted in the department of Microbiology, Dr. RML hospital & PGIMER. from June 2012 to June 2013. Only infants i.e. <1 year age children were included in the study. Urine samples were collected from pediatric and neonatal ICU and also from pediatric wards. A total of three hundred and thirty three urine samples were received for fungal culture and microscopy. Wet mount preparations were examined for visualization of yeast cells and culture was performed on SDA slants with and without antibiotics. Slants were incubated at 37° C and 25° C and were examined after 48 hours of incubation. Germ tube test was used to differentiate candida albicans from other candida species. All yeast colonies were identified based on color colony production on CHROMagar Candida. All candida species were confirmed by automated system- Microscan Walkaway 40plus system

Results:

Distribution of Candida isolates in infants from ICU and wards is shown in table 1. The isolation rate of candida species amongst the 333 samples was found to be 21.62% (7). Amongst 333 samples received 37 (11.11%) were positive for candida albicans while 35 (10.51%) were positive for non albicans candida species. 261 (78.37%) samples were negative for microscopic examination for budding yeast cells and had no fungal growth after 48 hours of incubation at 37° C and 25° C. 56.7% of the candida isolates were from ICU while 43.3% isolates were from infants admitted in wards (Table 1). So, in this study among 72 isolates of candida, *candida albicans* was found in 51.39% while non albicans candida species was found to be in 48.61% of the candida isolates (Table 1). Among non-albicans candida most common species were *C.tropicalis* followed by *C.krusei* and *C.parapsilosis* as shown in table 2.

Table 1- Distribution of Candida isolates in infants from ICU and wards:

Pediatric Units	No growth	Candida albicans	Non-albicans Candida species	Total
Pediatric ICU	64	15	18	97
Neonatal ICU	80	7	5	92
Neonatal ward	48	4	3	55
Pediatric ward	69	11	9	89
Total (n= 333)	261	37	35	333

Table 2: Distribution of various candida species in urine samples:

Etiological agents	No. of isolates	Percentage
C.albicans	37	51.39%
C.tropicalis	20	27.77%

C.krusei	9	12.5%
C.parapsilosis	6	8.3%
Total	72	-

Discussion:

Fungal UTI is one of the important factor for mortality and morbidity in hospitals and it incidence is increasing in all hospitalized patients (all areas of medical and surgical practice). Candiduria is rare in healthy people but relatively frequent in hospitalized patients (7). In this study, isolation rate of candida species was found to be 21.62%. In other study, 16.5% of culture from sampled patients yielded different species of *Candida*. In a study in Brazil, 22% of urine samples from hospitalized patients were positive for *Candida* species (8). Nayman Alpat *et al.*(9) had believed that long duration of ICU and hospital stay increase the prevalence of candiduria in patients. In addition, candiduria in ICU patients is a marker for increased mortality (10). ICUs is an important risk factor for catheter-associated urinary tract infections. In our study, 56.7% of the candida isolates were from ICU while 43.3% isolates were from infants admitted in wards. In addition, in a study conducted by Robinson et al. (11), mortality rate due to candiduria in infants in the neonatal intensive care unit was significant (30%). Many risk factors have been suggested to candiduria, such as broad spectrum antibiotics therapy, corticosteroids agents, immunosuppressive drugs, use indwelling catheters for urinary drainage, hematologic malignancies, urinary tract abnormalities and prematurity (4,12). Candiduria may be a result of contamination of the urine samples, urinary tract colonization or indicative of invasive UTI (12). However, several investigators believed that *Candida* infections are an emerging problem in pediatrics (4).

Outcome of candiduria in patients who are generally healthy is little. However, in high-risk patients, candiduria should be carefully evaluated for disseminated infection. Several reports showed that the distribution of *Candida* species in candiduria varies. *C. albicans* was considered to be the most common pathogen in neonate patients with candiduria followed by *C. parapsilosis* (13). In our study, *candida albicans* was found in 51.39% while among non albicans candida species most common isolate was *C.tropicalis*, followed by *C.krusei* and *C.parapsilosis*. Non-*albicans* species accounted for 71% and 64.4% of isolates

in Paul *et al.* (6) and Kobayashi *et al.* (8) reports, respectively. Management of candiduria remains controversial. Some of the clinicians have believed that the presence of *Candida* spp. in urine samples is marked as harmless colonization, or lower tract infection. On the other hand, candiduria is well known as an important risk factor for invasive candidiasis with considerable morbidity and mortality (14). Clinically two important antifungals, amphotericin B and fluconazole were used for the treatment of candiduria in patients (15, 16).

In conclusion, Candiduria is an increasingly difficult problem for clinicians to recognize and manage. It is important that the specific species responsible for symptomatic infection is identified, given the differences in antimicrobial susceptibility among *Candida* species.

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