Research Paper

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Candida Urinary Tract Infection (UTI) in Paediatric Population in Jamnagar District

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ABSTRACT

Background: UTI is a common paediatrics problem. It is causing distress to child and parents. Incidence of Candida UTI is increased in last few decades and to be very precise more by Candida non albicans than C.albicans. Aims: Present study was performed to identify Candida spp. in urine in paediatric population. Also we looked for age and sex differentiation if any. Methods: Total 100 samples were tested by microscopy and culture methods during the study period from January 2012 to June 2012. All culture growths were identified by different methods. Results: Candida spp. was identified in 14% (n=100) of samples. C.tropicalis (42.86%) was the predominant pathogen followed by C. albicans (28.57%), C.glabrata (14.29%), C.parapsilosis (7.14%) and C.krusi (7.14%). Candida UTI was identified more in males before 1 year and in female after 1 year. Conclusion: Fungal (Candida) infection should be one of the differential diagnoses while managing UTI. Non albicans spp. shares good amount of prevalence. Determinants like age and sex should also be considered.

INTRODUCTION

Urinary Tract Infection (UTI) is a common infection in paediatric patients [1]. It is causing significant morbidity in infant and in children [2, 3, and 4]. In younger children it is more severe and responsible for sepsis and death [5]. It is also causing distress to parents. Urinary system includes kidney, ureter, urinary bladder and urethra. UTI is classified as upper (kidney-pyelonephritis) versus lower [6] (bladder-cystitis, urethra-urethritis), complicated (structural or functional abnormalities or catheterisation in urinary system or immunocompromised host) versus uncomplicated [7, 8] (UTI in healthy patients with normal urinary tract). Presence of microorganisms in urine also creates three possibilities. (a) Contamination: Organisms are entering during collection or testing of urine. No health care required [8]. (b)Colonisation: Organisms are present but insignificant in numbers, no illness and no treatment required[8]. (c)UTI: organisms are present in significant numbers, illness to patients, treatment and management required. Etiologically UTI is classified as bacterial, viral, fungal and parasitic. Present study was carried out to highlight the prevalence of Candida spp. in paediatrics UTI.

Urinary system is present with several defence mechanisms like constant flushing by urine, mucosal surface, acidic ph of urine, low osmolarity and high urea concentration [6]. Breast feeding also provide protection against UTI via it's contain like IgA, lactoferrin etc [9, 10, 11]. Breast feeding protects urinary tract against infection in initial 7 month of life [10, 12]. In spite of above defence mechanisms Candida is able to produce infection in urinary tract by its virulence factors like toxin production, enzyme production, adhesion protein, complement receptors etc[13]. Candida infection also precipitated by host factors which includes low immunity, over use of antibiotics, obstruction and catheterisation [4, 13]. Clinically UTI is present with fever, vomiting, diarrhoea, jaundice, failure to thrive, lethargy in neonates while in infant and in young child it present with crying, fever and frequency of micturition[2,4]. In older children it present with dysuria, frequency, urgency, suprapubic or flank discomfort, incontinence [2, 4]. Urinary tract obstruction is indicated by crying, straining during voiding, dribbling, abnormal urine stream and palpable bladder [4]. If UTI is not diagnosed and treated earlier it may cause recurrent UTI, blood infection and renal parenchyma damage, renal scaring, hypertension, renal insufficiency or renal failure [2, 3, 7, and 14].

MATERIALS AND METHODS

Sample size: Over a study period of 6 months from January 2012 to June 2012 we received Total 100 samples in microbiology department, Shri M P S Medical College, Jamnagar.

Sample collection: In newborn all samples were collected by suprapubic aspiration while in infant and in older children mid stream urine samples were collected in sterile container.

Sample testing: All the samples were tested as follows.

Step 1: Direct microscopy by using gram stain to identify yeast cells, budding yeast cells, hyphae and pseudohyphae.

Step 2: Culture was done in 2 plates of Sabouraud Dextrose Agar (SDA) with antibiotics (chloramphenicol and cycloheximide). One plate was incubated at room temperature (25^{c}- 28^{c}) for mycelia growth and other at 37^{c} for yeast growth. Each plates were examined every 3^{rd} day for a period of three weeks before declared negative.

Step 3: All the culture growth were identified by culture characteristics, Lacto phenol Cotton Blue(LCB), germ tube test, Dalmau technique on corn meal agar, sugar assimilation test.

RESULTS:

Table 1: age and sex distribution of the study subjects

Age	Male	Female	total
<1 yr	40 (40%)	22 (22%)	62 (62%)
>1 yr(1-15year)	13 (13%)	25 (25%)	38 (38%)
Total	53 (53%)	47 (47%)	100 (100%)

Table 1 shows that the distribution of the samples sent by the clinicians. Overall male to female ratio is almost 1 but if we see the barrier of one year age then we find that in case of male less than one year it is almost double than the female of the same age group. And we found vice versa in case of age group 1-15yrs.

Table 2 age and sex-wise distribution of positive cases

Age	Male	Female	Total
<1 yr	07 (50.00%)	02 (14.28%)	09 (64.28%)
>1yr (1-15yr)	00 (00.00%)	05 (35.72%)	05 (35.72%)
Total	07 (50.00%)	07 (50.00%)	14 (100%)

Table 2 shows total 14 (14%) samples were found positive for Candida infection out of 100 samples. Positivity amongst male and female was found same (50% each).in male group all the cases (7 cases, 50%) belonged to less than one year. In the female counterpart affected age group was 1-15year (35.72%) and it had contributed more than double than the females of age less than one year (14.28%).

Table 3 distribution of various species of Candida among positive cases

Candida spp.	No.	% n=14
C.tropicalis	6	42.86%
C. albicans	4	28.57%
C.glabrata	2	14.29%
C.parapsilosis	1	7.14%
C.krusi	1	7.14%
Total	14	100%

Table 3 shows most common species we found was C. tropicalis (42.86%) followed by C. albicans (28.57%), C.glabrata (14.29%), C.parapsilosis (7.14%) and C.krusi (7.14%). Almost $3/4^{th}$ of the species belonged to non albicans group of Candida.

DISCUSSION:

Current study will indicate that 14% of paediatrics UTI is due to Candida spp. Most common pathogen identified in study was Candida tropicalis (42.86%) followed by C. albicans (28.57%), C.glabrata (14.29%), C.parapsilosis (7.14%) and C.krusi (7.14%).Candida albicans is a common pathogen in UTI but trend is shift to Candida non albicans which includes C.tropicalis, C.glabrata, C.parapsilosis, C.kefyr, C.krusi, C.utilis, C.lipolytica etc [Baradkar VP et al, 2008][15]. And reason cited was development of resistant to fluconazole.

In our study Candida UTI is more common in less than 1 year of patients (62%) may be due to low immunity, over use of antibiotics, catheterisation, prematurity and low birth weight. Among the less than 1 year of age males (40%) were more suffered than females (22%) may be due to uncircumcised prepuce skin. Previous study reported that uncircumcised prepuce skin raise 10-11 times more risk for UTI than circumcision in males[Ubelacker S, 2012] & [Wiswell TE & Geschke DW, 1989] [14] [16]. After the age of 1 year females (25%) were involved more than males (13%) may be due to shorter urethra and faecal or perineal colonisation.

CONCLUSION:

Current study indicates that if Candida UTI remains untreated causing major clinical manifestation in later life so early diagnosis for fungal cause and proper antifungal treatment is suggested. As data suggest UTI is common in male before 1 year and in female after 1 year which required improvement in genital hygiene. Study also emphasizes to minimize use of antibiotics, foreign object like catheter and to improve nutritional and breast feeding status.

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