



Original Research Article

Urinary tract infection in 1-12 years age group: A cross section study of 100 cases

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Abstract

Urinary Tract Infection (UTI) is one of the most common bacterial infections in the developing countries. Our study showed UTI was more common in female children than male children but not so significant, the ratio of female: male being 1.04:1. Mean age of male was 5.13 ± 3.57 years, and in females it was 5.27 ± 3.67 years, study age group being 1 to 12 years. Fever was the most common presenting clinical feature, seen in 88 cases (88%). Rare clinical findings include incontinence and unusual urine smell seen in 3 cases and 1 case respectively. E. coli was the most common organism isolated.

Key words

Urinary tract infection, Fever, E. coli, Dysuria, Baroda.

Introduction

It consists of a variety of clinical conditions ranging from asymptomatic presence of bacteria in the urine to severe infection of the kidney with resultant sepsis [1]. Urinary Tract Infection (UTI) is one of the most common bacterial infections encountered by clinicians in developing countries [1]. UTI is a major cause of morbidity among children. Around 1-3% of boys and 3-10% of girls are affected by UTI [2] though the incidence is more or less equal during

infancy. Clinical presentation depends on age, site of infection and severity. Newborns may show nonspecific symptoms such as poor feeding, irritability and weight loss. Older boys may have urethral discharge and adolescent girls may experience vaginal irritation and symptoms like pelvic inflammatory disease. Clinical pyelonephritis is characterized by abdominal or flank pain, chills and rigors, fever, malaise, vomiting, and occasionally diarrhea.



Materials and methods

The present study was conducted in children in the age group of 1 to 12 years at OPD and indoor patients at the Department of Pediatrics, S.S.G. Hospital, Baroda, Gujarat, India during the period of 1st April 2014 to 30th November 2014. We selected 100 cases during this study period comprising 48 male children and 52 female children.

Oral consents were taken from the guardians or parents before enrolling them in the study.

Detailed history (about fever, abdominal pain, vomiting, frequency of urination, dysuria, smelly urine, etc.) of patients and clinical examination was done in all cases with special emphasis being given to UTI Symptoms. Patients were suspected to have urinary tract infection if they had unexplained fever $>38^{\circ}\text{C}$, passing turbid urine, dysuria, suprapubic tenderness and smelly urine and they were subjected for routine urine and microscopic examination. Those urine samples with pus cells > 5 per high power field in centrifuged urine on routine urine examination were sent for urine culture and sensitivity test. Specimens were collected (after cleaning the perineal area) by clean catch mid stream specimen method for children who were able to control urination and sterile plastic bags method for younger children who were not able to control urination. Contamination by periurethral and prepucial organisms shall be minimized by washing the genitalia. 50 ml of clean catch mid stream urine specimen was collected in a sterile universal container. A specimen was considered positive if a single organism was isolated at a concentration of greater than 10^5 CFU/ml and associated with microscopy findings of greater than 5 pus cells/high power fields in the centrifuged urine.

The Collected urine samples were sent for culture and sensitivity test. All the samples were

inoculated on Mac Conkey and Blood Agar media using a 0.01 ml calibrated nichrome loop following standard bacteriological technique and incubated at 37°C for 24 hours under aerobic condition to obtain accurate colony count. On culture of mid stream sample of urine, a colony count of more than $10^5/\text{ml}$ organisms of a single species was considered significant.

Results and Discussion

Age and sex wise distribution of cases was as per **Table - 1**. Mean age of male was 5.13 ± 3.57 years, and in females it was 5.27 ± 3.67 years. This difference was not significant ($p=0.56$). Our study showed UTI was more common in female children than male children but not so significant, the ratio of female: male being 1.04:1. Studies conducted by Akram M, et al. at Aligarh in 2007 [3], Bouskraoui M at Marrakech in 2010 [4] and Malla KK, et al. at Nepal in 2008 [5] also reported female predominance, with a variable ratio ranging from 6:1 to 1.33: 1, depending upon the different sample size and difference in age groups being studied. Reason behind low percentage of UTI among males was longer course of urethra and bacteriostatic secretion by prostate gland as mentioned by Malla KK, et al. at Nepal in 2008 [5], Akram M, et al. at Aligarh in 2007 [3] and Bouskraoui M at Marrakech in 2010 [4] which was also consistent with our study. Our study showed majority of cases were in the age group of less than 6 years.

Distribution of cases according to the residence was as per **Table - 2**. Out of 100 patients, 52% patients were from Rural area while 40% from Urban area and 8% from Tribal area of Limkheda, Godhra, Panchmahal etc. (**Table - 2**) There is paucity of literature regarding this area wise distribution of cases. In the present study, we observed slightly more cases from the rural background. This may be explained by the fact that the S.S.G. Hospital has wide catchment area of the surrounding villages.

Fever was the most common presenting clinical feature, seen in 88 cases (88%). It was followed by clinical feature like dysuria, abdomen pain and vomiting. Rare clinical findings include incontinence and unusual urine smell seen in 3 cases and 1 case respectively. (**Table – 3**)

As in our study, other authors Sumit Gupta, et al. at Agra in 2013 [6], Yüksel S, et al. at Turkey in 2006 [7] also reported fever as the most common clinical feature in UTI. Vomiting and pain abdomen are also frequent clinical features in pediatric age group. Urinary symptoms like urgency, burning sensation or pain during micturition is also very common. Similar finding was also reported by A Sharma, et al. at Nepal in 2011 [8].

Important physical findings in culture positive cases like raised body temperature, ill and toxic appearance, dehydration, puffiness of face, suprapubic tenderness and pedal edema were as per **Table - 4**. In 10 cases, 10% there was Phimosis. In 5 cases, 5% there was associated signs of lower respiratory tract infection.

Higher incidence of fever with urine culture positivity was also observed by Sumit Gupta, et al. at Aligarh in 2013 [6].

E. coli was the most common organism isolated and constituted 38.42% of all positive samples and followed by klebsiella spp. (**Table – 5**)

Sumit, et al. in Assam in 2013 [8] in his study most commonly isolated pathogen was E. coli (27.05%) in both sex followed by Klebsiella (18%) and proteus (11.76%). According to Rai G.K. et al. at Nepal in 2008 [9], E. coli constituted for 93.3% of the cases and it was followed by Proteus sp, Klebsiella sp, Citrobacter sp, Staphylococcus aureus and others. Similar finding was also reported by Shalini, et al. at Bareilly in 2011 [10].

Conclusion

UTI was more common in female children than male children with ratio of female: male being 1.04:1. Mean age of male was 5.13 ± 3.57 years, and in females it was 5.27 ± 3.67 years, study age group being 1 to 12 years. Fever was the most common presenting clinical feature, seen in 88 cases (88%). Rare clinical findings include incontinence and unusual urine smell seen in 3 cases and 1 case respectively. E. coli was the most common organism isolated.

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Table - 1: Age and sex wise distribution of cases.

Age	Male	% Male	Female	% Female	Total
1--3	21	42.86	20	39.22	41
3--6	10	20.41	14	27.45	24
6--9	11	22.45	8	15.69	19
9--12	7	14.29	9	17.65	16
Total	49	100	51	100	100

Table - 2: Cases distribution according to area of residence.

Area of residence	No of patients	Percentage
Rural	52	52
Urban	40	40
Tribal	8	8
Total	100	100

**Table - 3:** Cases distribution according to clinical features (n=100).

Clinical features	No. of cases	Percentage
Fever	88	88
Vomiting	50	50
Abdomen Pain	51	51
Dysuria	57	57
Enuresis	9	9
Incontinence	3	3
No Complaints	2	2

Table - 4: Physical findings in culture positive cases (n=100).

Signs	Culture positive cases	Percentage
Temperature (37.4 °C)	88	88
Ill and toxic appearance	32	32
Dehydration	25	25
Puffiness of face	22	22
No other signs	26	26
Pedal edema	12	12
Bladder distension	11	11
Renal angle tenderness	12	12
Supra pubic tenderness	13	13
Ascites	12	12
Phimosis	10	10
Hypertension	4	4
Signs of acute upper respiratory tract infection	10	10
Signs of lower respiratory tract infection	5	5

Table – 5: Common organisms isolated in urine culture.

Organism	Number	Percentage
E. coli	34	34
Klebsiella Spp.	18	18
Pseudomonas Spp.	12	12
Candida	13	13
Proteus Spp.	6	6
Enterococcus	5	5
Enterobacter Spp.	4	4
Others	8	8
Total	100	100