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Original Article

CLINICAL PROFILE AND UNDERLINE RISK FACTOR OF UTI IN PAEDIATRIC AGE GROUP

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ABSTRACT

Objective: We carried out a study in the department of paediatric medicine at the Chandka Medical College hospital Larkana to determine the clinical presentation and early detection of associated abnormalities in order to prevent long term consequences.

Methods: The study was conducted over a period of one and half year from June 2011 to December 2013. In infants 2 months of age presented with sepsis or unexplained fever, hypotension, shock, jaundice, failure to thrive, diarrhoea,recurrent vomiting, feeding problems, irritability, cyanosis, polyuria, and metabolic acidosis were examined and investigated thoroughly. The diagnosis was depending upon Urine analysis, Urine culture and sensitivity, Ultrasound KUB, MCUG, IVP (when needed) in a child with suggestive clinical features.

Results: A total of 54 patients' children were diagnosed to have UTI during the study period. The major clinical features at presentation were fever 35 (64.81%), failure to thrive 32 (59.25%), anaemia 26 (48.15%), Abdominal pain 20 (37.03%), Urinary complain 20 (37.03%) , Persistent Diarrhoea 9 (16.67%) and Hematuria7 (12.96%). All the patients were investigated for associated risk factors.

Conclusion: This study highlights the importance of common clinical features like fever, failure to thrive, anaemia, Abdominal pain, Urinary complain, Persistent Diarrhoea and Hematuria being the presenting features of UTI and early investigated for associated abnormalities in amending life threatening consequences like end staged renal disease.

Keywords: - Urinary tract infection, Hematuria,

INTRODUCTION

The urinary tract is a common site of infection in the paediatrics population. Unlike the generally benign course of urinary tract infection (UTI) in the adult population, UTI in the paediatrics population is well recognized as a cause of acute morbidity and chronic medical conditions, such as hypertension and renal insufficiency in adulthood [1]

At least 8% girls and 2% boys have suffered one episode of UTI during school

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age. During first year of life UTI is more common in males and above 1 year more common in females. Most prior studies have estimated 6 to 12 months UTI recurrence rates of 20% to 48%, [2] The main risk factors for UTI in children are Posterior urethral valve, vesicouretric reflux, neurogenic bladder and renal scars [3] Escherichia coli remains the most common organism causing UTI in children (60–92%). Other common organisms include Klebsiella, Proteus, Enterococcus, and Enterobacter spp. [9–11]. Less common organisms such as Pseudomonas, Group B Streptococcus, and Staphylococcus aureus are seen with increased frequency in patients with anatomical defects, kidney stones, following genitourinary surgery or bladder catheterization, and following repeated courses with antibiotic treatments[4] The reference standard for the diagnosis of UTI is a single organism cultured from a specimen obtained at the following concentrations: suprapubic aspiration specimen, greater than 1,000 colony-forming units per ml; catheter specimen, greater than 10,000 colony-forming units per ml; or clean-catch, midstream specimen, 100,000 colony-forming units per ml or greater. [3-5]

Clinical manifestations of UTI are also age dependent. Apart from fever, older children can express and localize flank pain, abdominal pain, suprapubic pain with dysuria, urgency, or secondary enuresis in a previously toilet-trained child associated with pyelonephritis compared with infants with pyelonephritis, who may present with a combination of symptoms that include fever, irritability, excessive crying, diarrhoea, and poor feeding. In young infants and children, fever is of special importance as a clinical marker of renal parenchymal involvement (pyelonephritis). As acknowledged by the American Academy of Paediatrics (AAP) in its practice parameters, the presence of high fever (<39°C) with clinical diagnosis of UTI is an important indicator of pyelonephritis compared with no fever (<38°C) in those with cystitis. [6] Diagnostic workup should be modified according to conditions which may predispose to the development of recurrent UTI and complications because of stasis of the urine in the bladder, which includes Renal calculi, obstructive uropathy (posterior urethral valves), vesicoureteral reflux, and voiding disorders.[7]

METHODOLOGY

Inclusion Criteria

- Age 1 month to 15 year
- Sex Both sexes
- Acute renal failure
- Chronic renal failure

Exclusion Criteria

- Age <1 month
- Fever with known cause

This descriptive study using non probability (convenience) sampling technique was carried out over a period of one and half year from June 2011 to December 2013 in Paediatric Department Chandka Medical College Hospital SMBBMU Larkana. A detailed history was taken and complete clinical examination was carried out all young infants and children presented with Unexplained fever, Persistent Diarrhoea, Anaemia, Failure to Thrive, Abdominal pain, Specific Urinary Symptoms, (Dysuria, urgency, frequency enuresis, hematuria and oliguria) and investigated thoroughly. The diagnosis of urinary tract infection was based on microscopic finding of more than 5 white blood cells per high power field on urine microscopy and a colony count of 105/ ml of single pathogen by Urine analysis, Urine culture and sensitivity, Ultrasound KUB, MCUG, IVP (when needed) in a child with suggestive clinical features. All the antibiotics were discontinued 72 hours before sending the urine for culture and sensitivity. The main aim of the study was to find out the clinical presentation and underline risk factor of UTI in paediatric age group. All investigations were carried out in the Pathology Department of Chandka Medical College and Agha khan lab Larkana. The details of each patient were recorded in a Proforma.

RESULTS

A total of 54 children aged of 2 month twelve years were included. Ten were excluded; the treating clinician felt nine were unsuitable and the documentation was lost for one, leaving 54 for analysis. Thirty two children 32(59.2%) were male and 22 (40.8%) were female. The median age was 24

(TABLE 1)
AGE & SEX DISTRIBUTION

Age	Male		Female		Total
	Frequency (n=32)	% age	Frequency (n=22)	% age	No &%
2 months-5years	18	(33.3%)	06	(11.1%)	24(44.44%)
5-10 years	08	(14.4%)	06	(11.1%)	14(25.92%)
>10-12 years	06	(11.2%)	10	(18.5%)	16(29.62%)
Total	32		22		54

TABLE 2
Presenting Features of Children with UTI

Clinical features	Number & Percentage
Fever	35 (64.81%)
Failure to Thrive	32 (59.25%)
Anaemia	26 (48.15%)
Abdominal pain	20 (37.03%)
Urinary smell	20 (37.03%)
Persistent Diarrhea	9 (16.67%)
Hematuria	7 (12.96%)
History of Pyuria	5 (9.26%)
Dribbling of urine/ bed wetting	4 (7.41%)
Facial puffiness	4 (7.41%)
Oliguria/dysuria	3 (5.56%)
Retention of urine	3 (5.56%)
Bladder palpable	3 (5.56%)
Hypertension	2 (3.70%)

TABLE 3
Risk Factors for UTI

S.No	Risk Factors or Associated anomalies	Cases (%)
1.	Bilateral VUR	17 (31.48%)
2.	Unilateral renal calculi	14 (25.93%)
3.	Unilateral VUR	6 (11.11%)
4.	Bilateral renal calculi	5 (9.26%)
5.	Pelviureteric junction obstruction (PUJO)	3 (5.56%)
6.	Hypoplastic / Dysplastic kidneys	3 (5.56%)
7.	Posterior urethral valve	2 (3.70%)
8.	Vesical calculi	1 (1.85%)
9.	Bilateral megaureter	1 (1.85%)
10.	No abnormality detected	2 (3.70%)
	Total	54 (100%)

months (Table 1) The most common presenting symptom was Fever 35 (64.81%), followed by Failure to Thrive 32 (59.25%). Non-specific constitutional symptoms, e.g. irritability, crying more than usual, tiredness, poor sleep, and poor appetite, were present in over 52% of children, Anaemia 26 (48.15%),Persistent Diarrhoea 9 (16.67%), Abdominal pain 20 (37.03%). Specific urinary symptoms were uncommon: smelly urine 20 (37.03%), increased frequency (9%), cloudy/dark urine 7 (12.96%) pain/crying on passing urine 4 (7.41%), and day or bed wetting when previously dry 4 (7.41%). (Table 2) In this study most of cases presented with one of associated abnormality that's would be cause of recurrent UTI and long term squally so they includes VUR 23(42.59%) , renal calculi 19(35.19%), Pelviureteric junction obstruction (PUJO), 3(5.56%), Hypoplastic / Dysplastic kidneys 3 (5.56%) and No abnormality was detected in only 2 cases (3.70%). (Table 3)

DISCUSSION

Urinary tract infection (UTI) is one of the commonest bacterial infections seen by pediatricians in children.[1] However, diagnosis remains a difficult task probably because its presentation is non-specific and similar to other common illnesses. This makes it easy to miss children with UTI. In previous studies most of cases of UTI reported among the children younger than 5 years was demonstrated in this study, where 24 (44.44%) of them were under-5 children, 14 (25.92%) children 5-10 years and 16(29.62%) were in fact more than 10 years old.[1–3] Although UTI was more common among males in this study, the male to female ratio of 1:10 found in earlier studies in Hazara children and

others was not confirmed by the findings in this study.[2,3] This finding is however similar to previous Nigerian reports.[1,3–5] The reason for this is not clear; Similar to other studies, fever was the predominant presenting symptom reported in 64.81% of patients and high prevalence of other non-specific symptoms like failure to thrive vomiting and diarrhea 3,9 and the relative rarity of disease-defining symptoms like loin pain, frequency of micturition and dysuria in this study apparently support the need for screening all febrile children for UTI.[1,2,6] In this study patients less than 5 years constituted 24(44.44%) of total infected patients which coincides with other studies.[8,9, 10] This could be due to more susceptibility to infection due to toilet training problems in this age. Majority of patients 32 (59.25%) having common presentation of failure to thrive, can be explained, by poor hygienic conditions, poverty, late circumcision, malnutrition and inadequate health care facilities in catchment area that's similar to other studies from this area. [8,9,10] Fever was the most common symptom in 35 (64.81%) of cases and as other studies also indicate the high association between fever and urinary tract infection.[6,7,12] Underlying malnutrition with recurrent infection and poor intake has been blamed for it.4 Dysuria was reported in (4%–65%) cases but it can also be presenting symptom in infants and children.[8,10] as this study shows (5.56%) of cases with dysuria. Pain abdomen is also non-specific finding in patients having UTI, 20 (37.03%) of our patients presented with generalized abdominal pain , lumber tenderness and hypogastric pain in descending order of frequency as reported in previous studies.[8,9,10] Other associated findings present in our patients with UTI, like Urinary smell 20 (37.03%) and palpable urinary bladder 3 (5.56%) is comparable to previous studies where children were identified with urinary tract symptoms as having UTI.[9,10,11] Specific urinary symptoms were uncommon: as similar to earlier reported study includes smelly urine (15%), increased frequency (9%), cloudy/dark urine (8%), pain/crying on passing urine (4%), and day or bed wetting when previously dry (1%). While a study in adults shows most of patients presents with these specific symptoms.[10.11] In children increase risk of UTIs often occur at the onset of toilet training because of voiding dysfunction. At that age child is trying to retain urine to stay dry, nevertheless the bladder may have uninhibited contractions forcing urine out, that's can leads to high-pressure, turbulent urine flow or incomplete bladder emptying, both these factors increase the likelihood of bacteriuria. [3,6, 12,13] Voiding dysfunction can occur in the toilet-trained child who voids infrequently. While the school-age children can develops similar problems who refuse to use the school bathroom. Obstructive uropathy resulting in hydronephrosis increases the risk of UTI because of urinary stasis. Any urinary procedure like Urethral catheterization can infect the bladder with a pathogen. Constipation which results in fecal impaction that's increase the risk of UTI because it can cause voiding dysfunction.[12, 13, 14] In most of world studies there is increase risk of UTI with these disorder. [7, 12, 13] This study also shows most of cases presented with one of associated abnormality that's would be cause of recurrent UTI, like one of Indian study by Taneja N, shows commonest underlying illnesses associated with UTI were PUV (27.6%), VUR (19.9%), neurogenic bladder (22, 5.1%), PUJO (15, 3.5%), other congenital anomalies of the urinary tract (14, 3.3%), renal stone disease (4, 0.9%).[14] Another one study conducted in iran by Ahmadzadeh A, thats shows . VUR was bilateral in 50 (39.6) and unilateral in 32(25.3%). urolithiasis in 10 (7.9%), obstructive hydronephrosis in 8 (6.3%), neurogenic bladder in 3 (2.38%) three (two boys and one girl), and posterior urethral valves (PUVs) in 2 (1.58%) boys. [7]

CONCLUSION

UTI is a common paediatric problem with the potential to produce long-term morbidity such as renal scarring, in this study most of young children presenting with fever and other nonspecific symptoms of UTI. UTI in such high risk children should be treated and investigated aggressively. Underlying renal anomalies may be the cause of renal scarring so the prevention of renal scarring remains the goal of all therapies for childhood UTI. This support the idea that nearly all the patients with UTI need a complete imaging work up. We recommend that ultrasound, VCUG and scan should be routinely performed on all patients after the first UTI. DMSA scan may also be performed if any abnormality is detected on these studies. Further research may define whether routine performance of these tests improves outcomes or not.

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