

Prevalence of Urinary Tract Infection in Children with Fever Less Than 2 Years of Age.

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Abstract:

Urinary tract infection is identified by the presence of pyuria and at least 50,000 colonies/ml of single pathogenic organism in urine sample collected appropriately. In young children the only symptom may be fever, there may be other signs like irritability, poor feeding, vomiting.

Aim:

To study the prevalence of urinary tract infection in children < 2 years of age with fever presenting to hospital and compare urine analysis and urine culture to detect urinary tract infection (UTI).

Methods:

All children from 1 month to 2 years of age with fever without focus admitted to the paediatric ward Private hospital Dhanbad were included in this study.

Results:

Out of 100 cases of febrile children with no localising signs were included in this study. 37 children were females and 63 were males. E.coli was predominant cause of urinary tract infection. Urine analysis was positive in 7% of cases and culture was positive in 15% of cases suggesting urinary tract infection.

Conclusion:

Urine culture should be the essential part of evaluation of young febrile children with no localising signs.

Keywords: febrile young children, UTI, urine culture, urine analysis.

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I. Introduction:

Urinary tract infections (UTI) is one the most common paediatric infection and accounts for 0.7% outpatient visits (OPD) and 5 – 14% of emergency visits annually. Urinary tract infections (UTI) are highest during first 2 years of life. The incidence is less in older children. In neonates and young children who have fever with no focus the rates of UTI vary from 7 – 15 %.

In children with fever who are less than 2 years of age, the only symptom of urinary tract infection may be fever. In neonates and infants there may be irritability, poor feeding, lethargy, vomiting. The older children may present with urinary incontinence, increased frequency, dysuria, pain abdomen. Therefore the presenting signs and symptoms of urinary tract infection (UTI) are nonspecific in young children.

Fever without focus is the temperature of 38°C (100.4°F) or higher as the only presenting symptom. Febrile children less than 2 years of age constitute set of children who present presents with fever without a focus. The workup of fever in these children always include evaluation of urinary tract infection(UTI) and even single confirmed UTI should be taken seriously. The important long term complication of complicated UTI or pyelonephritis is renal scarring which may lead to hypertension and end stage renal disease (ESRD) and requires regular follow up. The aim of this study is to determine the prevalence of UTI in febrile children less than 2 years of age. Under diagnosis responsible for large number of patient developing end stage renal disease (ESRD).

Therefore it is necessary to evaluate UTI in febrile children.

II. Method:

The study was conducted in paediatric department of a private hospital, Dhanbad. It was a prospective study conducted over a period of 9 months . 100 children aged 1 month – 2 years of age with fever (axillary temperature > 38°C or 100.4°F) who were admitted were included in this study, without any previous history of urinary tract infection (UTI).

EXCLUSION CRITERIA:

1. Children with other known causes of fever through proper history and clinical examination.
2. Children on antibiotics.

3. Children with comorbidities like spina bifida, urological surgery other than circumcision, immunodeficiency, and immunosuppressive drugs.
4. Children with congenital anomalies of urinary tract like hypospadias, ectopic vesicae, which make collection of urine difficult.

For urine analysis, urine sample was collected in sterile container. The sample was processed within hour of collection. Sample was transferred to centrifuge tube and spun at 1500 rpm for 5 minutes. Supernatant was discarded and sediment was taken and slide was seen with microscope for detection of leukocytes. > 5 leukocytes/hpf was considered significant. Urine culture was considered gold standard for diagnosis of UTI. Suprapubic aspiration or urethral catheterization was performed to collect sample. Collected samples were plated within 1 hour of collection. Mac – Conkey agar plates were used, incubated at 37°C and examined for growth for 2 days. A positive urine culture is growth > 5 × 10⁴ colony forming unit/ml on urethral catheterization or any number of pathogen if collected by suprapubic aspiration. Children who were urine culture positive were treated with appropriate antibiotics and further radiological evaluation was done.

All children who were urine culture positive underwent USG of kidney and urinary bladder and all children with abnormal USG was advised micturating cystourethrogram (MCU), 2 – 3 weeks after treatment of UTI and dimercaptosuccinic acid (DMSA) 2 – 3 months after treatment of UTI.

III. Results:

A total of 132 children came with fever with no focus, 25 refused to join study and 7 were lost to follow up so 100 children were included in this study and were analysed for presence or absence of UTI.

An age wise analysis showed

1. 8 children were < 6 months of age.
2. 35 children were between 6 months – 1 years of age
3. 28 children were between 1 - 1½ years of age.
4. 29 children were 1½- 2 years of age.

Out of 100 children, 37 (37%) children were females and 63 (63%) children were males. Among them on urine analysis 7 children (7%) were found to have 5 or more pus cells in centrifuged sample and 93 children showed no pus or < 5 pus cells.

Urine analysis and urine culture showed UTI was more in males but it was not statistically significant.

Urine culture was positive in 15 children (15%) out of which 4 were females and rest were males which again was statistically insignificant. Duration of fever and age was compared in both urine analysis and urine culture negative and positive samples but there was no statistically significant difference between the 2 groups.

Sensitivity of urine culture was 96.7% and specificity was 91.4% for detecting UTI in febrile children with no focus, p< 0.001 and statistically significant on comparing urine culture with urine analysis. So urine culture should be investigation of choice in children < 2 years of age with fever presenting without focus. Urine culture was positive in 15% children out of which Escherichia coli (E. coli) was grown in 7 case (46.6%) and 4 cases were positive for Klebsiella (26.6%) and 4 cases were positive for Enterococcus (26.6%) .

URINE CULTURE REPORT RESULT	FREQUENCY
E. COLI	7
KLEBSIELLA	4
ENTEROCOCCUS	4

All patient who were urine culture positive were followed up with USG and DMSA scan. Abnormal USG finding were present in 4 out of 15 children (26.6%)

Urine culture	TOTAL	Urine analysis	Sensitivity	Specificity	p value
		POSITIVE	NEGATIVE	96.7	91.4
POSITIVE	15	7	8		<0.04
NEGATIVE	85	5	80		
TOTAL	100	15	85		

IV. Discussion:

UTI is defined by presence of organism in urinary tract. Young children with UTI present with nonspecific symptom like lethargy, poor feeding, vomiting or fever alone, so role of UTI as cause of febrile illness has been increasingly understood so its screening becomes important.

Gold standard for diagnosis of UTI is positive urine culture. If urine culture shows > 50,000 colonies in catheter sample or single pathogen in suprapubic aspiration sample or if there is 10,000 colonies and child is symptomatic then child is considered to have UTI.

In this study positive urine culture was seen in 15 % cases of febrile illness with no focus. Incidence of UTI is highest in first 2 years of life. Among culture positive children majority were males as compared to females 11% were males and 4% were females.

UTI was most commonly seen in males, it may be due to gender biasing of bringing more febrile males for medical attention than female children. Other studies showed similar prevalence in males and females with fever and no focus.

In our study 7 children have E.coli grown in culture, 4 were positive for Klebsiella and 4 were positive for enterococcus. E. coli is the most common organism and this is consistent with 2 more studies, 62.8% cases from south India and 62.2% cases from Chandigarh.

E.coli was found to be most common pathogen followed by gram-ve organism.

Febrile UTI are the most common serious bacterial infection in children with renal scarring as frequent outcome. USG was abnormal in 4 cases (26.6%) . these results shows the importance of further investigations and follow-up of these children so that any structural abnormalities can be detected and managed to prevent lifelong complication and children with abnormal USG should be screened with DMSA and MCU.

V. Conclusion:

Urine culture should be mandatory investigation in febrile children less than 2 years of age with no focus.

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