RESEARCH

PERSPECTIVE STUDY OF URINARY TRACT INFECTIONS IN INFANTS WITH ACUTE FEVER IN SOUTH KARNATAKA

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Abstract

Background: Urinary tract infection (UTI) in infants with acute fever is identified by the presence of both pyuria and uropathogenic organism. If untreated leads to Hypertension, end stage renal disease and prolonged morbidity. **Materials and Methods:** 95 infants admitted for fever were studied. Symptoms were increased frequency of micturation, crying while voiding and pyuria compete general and systemic examinations were done to rule out. Phimosis, vulvular synechiae, supra-pubic mass, renal mass, dysmorphic features were observed and associated congenital anomalies. Provisional diagnosis was done mainly based on signs and symptoms. Routine Urine analysis, microscopic analysis of Urine, Urine culture was carried out. Positive patients were further examined by USG, MCU, more over differential diagnose was also done to confirm the UTI. **Result:** 95 (100%) fever, 36 (37.8%) vomiting, 56 (58.9%) irritability, 67 (70.5%) failure to thrive, 14 (14.7%) Jaundice, 20 (21.05%) convulsion The provisional diagnose included, 29 (30.5%) 24 (25.2%) fever without focus, 14 (14.7%) URTI, 18 (18.9%) UTI, 9 (9.47%) septicaemia, 5 (5.45%) Bronchitis. The highest antibiotic sensitivity of organism growing urine culture sample was 85 (89.4%) was Amikacin, followed by 69 (72.6%) oflaxacin, 56 (58.9%) Norfloxacin, 39 (41.05%) gentamicin and least was 10 (10.5%) ceftriaxant. **Conclusion:** The present study demands latest technique to rule out UTI immediately, because present investigating technique is time consuming and delayed report will be delay to diagnose and prolongs morbidity.

INTRODUCTION

Urinary tract infection (UTI) is one of the most common paediatric infections observed in Paediatric UTI accounts for 0.7% of OPD (outpatient Department) visits and 5%-14% of emergency department visits by infants annually.[1,2] UTI's are the highest in children during the first 2 years of life. The incidence is much less in order children. In neonates and young infants who have fever with no localization, the reported cases of UTI vary from 7% to 15 %.[3,4] In children <1 years the only symptoms of a UTI may be fever. Infants may have poor feeding, recurrent vomiting or show excessive sleepiness. In order children UTI may present as new onset urinary incontinence. Thus presenting signs and symptoms of UTI in young children are often very nonspecific. Therefore, paediatricians are in dilemma to decide whether or not to obtain a urine sample for urine analysis for culture.

Fever without focus refers to a rectal temperature of 38oc (100.4oF) or higher as the sole presenting feature.[5,6] Febrile infants younger than 2 years constitute an important subset of children who may present with fever without focus. The presence of fever in those children should always include evaluation for UTI. Even a single confirmed UTI should be taken seriously especially in children below 2 years. The main long term consequences of complicated UTI or pyelonephritis is renal scarring which may lead to hypertension and end stage renal disease which may require long term follow-up.[7,8] Hence attempt was made to evaluate the fever in infants with various manifestations or without focus to rule out UTI, So that the present study will be helpful paediatrician to treat UTI in infants with fever.

MATERIALS AND METHODS

95 (Ninety-five) infants admitted at Akash Institute of Medical Sciences and research institute were studied.

Inclusive Criteria

Any febrile infants with an axillary temperature > 100o F or 37.8oC irrespective of provisional diagnosis was selected for study.

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Exclusion Criteria

Febrile infants who had received antibiotics before attending OPD ad those requiring admission, intensive care therapy and / or immediate antibiotics in cases of pyogenic meningitis, severe pneumonia, shock, status epileptics was excluded from the study.

Method

A detailed history was obtained with special emphasis on urinary symptoms such as increased frequency, crying while voiding, and pyuria. Complete general and systemic examinations were also done with attention to urological findings such as phimosis, vulvular synechiae, suprapubic mass, renal mass, dysmorphic features and other associated congenital anomalies. A provisional diagnosis was made mainly based on presenting signs and symptoms, intake output charts, wound site infections and other complications.

Mothers were trained through verbal instructions to collect urine using the CCU method in a sterile bottle. They were asked to clean the perineum with clean water, breast feed the baby frequently, and apply the mild pressure over the supra-pubic area every 15 minutes.

In routine urine analysis, urine microscopy was done using un-centrifuged urine. An observation more than 5 pus cells / high power field (HPF) was the threshold for pyuria, a positive diagnosis of UTI (5). For Urine culture, the urine specimen was inoculated for culture in Macconkey culture media using the standard loop technique. The average time from urine collection to inoculation was 30 min. UTI was diagnosed only when a single uro-pathogen with CFU≥ 105 / ml was present designated as significant growth. Growth of uncommon organism such as staphylococcus, pseudomonas and citrobacter and growth of multiple organisms were considered as a sign of urine sample contamination. The culture positive cases were tested for sensitivity by inoculating in nutrient agar and using combined gram negative microbial sensitivity disk for UTI.

In culture proven infants, further investigations such as abdominal ultra-sonogram (USG), micturating cysto urethogram (MCU), and isotope scan studies were advised to know the underlying anomalies of the renal tract. These infants were treated with appropriate antibiotics for 10 days and were asked to continue with prophylactic medication until all the imaging studies were over all the imaging studies were over.

Differential Diagnosis of UTI – Inflammation of the external genitilia, vulvitis and vaginitis caused by yeast, pin worms and other agents may be accompanied by symptoms mimicking cystitis on the basis of history and result of urine culture. Radio logically, the hypo plastic or dysplastic kidney or a small kidney secondary to a vascular accident may appear similar to a kidney with chronic polynephritis, with the later however, VUR (vesicoureteral reflux) is usually present.

Pyuria – Pyuria (> WBC / HPF in a centrifuged specimen) is a hall mark of polyunepritis with sensitivity and specificity of 30-50%. However, pyuria alone is in not satisfactory for making a diagnosis, as a number of conditions are associated with sterile pyuria including hydration, instrumentation, chemical inflammation, oral polio vaccine administration, non-specific gastro-entritis, and respiratory tract infection, pyuria is strong supportive evidence of UTI in the presence of positive culture. Many (20-50%) patients with bacteriuria with UTI do not demonstrate significant pyuria. The most accurate method of measuring pyuria is to quantities the urinary leukocyte excretion rate.

The duration of study was June-2020 to July-2021

Statistical Analysis

Various clinical manifestations, provisional diagnosis, antibiotic sensitivity of organism were classified with percentage. The statistical analysis was carried in SPSS software. The ratio of male and female was 3:1.

RESULTS

[Table 1] Clinical manifestation of UTI – 95 (100%) fever, 36 (37.8%) vomiting, 56 (58.9%) irritability, 67 (70.5%) failure to thrive, 14 (14.7%) Jaundice, 20 (21.5%) convulsion

[Table 2] Provisional diagnosis in UTI infants – 29 (30.5%) gastroenteritis, 24 (25.2%) fever without focus, 14 (14.7%) Upper respiratory tract infections (URTI), 18 (18.9%) UTI, 9 (9.47%) septicaemia, 5 (5.45%) Bronchitis

[Table 3] Antibiotic sensitivity of organism growing in urine culture samples – 85 (89.4%) Amikacin, 69 (72.6%) oflaxocin, 56 (58.9%) Norfloxacin, 39 (41.05%) gentamicin, 16 (16.8%) Nitrofuradantin, 14 (14.7%) Nalidixic acid, 10 (10.5%) ceftriaxane, 12 (12.6%) cefixime.

Table 1: Clinical manifestation of UTI infants

Clinical Manifestation	No. of patients	Percentage %
Fever	95	100%
Vomiting	36	37.8 %
Irritability	56	58.9
Failure to thrive	67	70.5
Jaundice	14	14.7
Convulsion	20	21.05

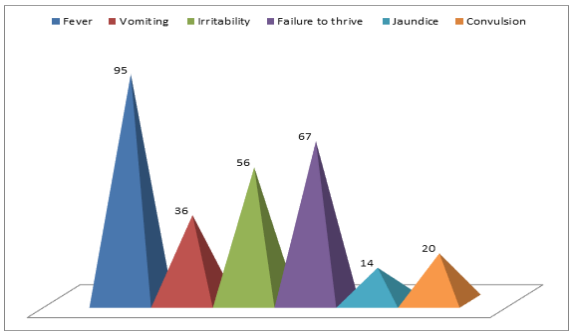

Figure 1: Clinical manifestation of UTI infants

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Table 2: Provisional diagnosis in UTI infants

Particular	Number	Percentage %
Gastro-enteritis	29	30.5
Fever without focus	24	25.2
Upper Respiratory tract infection (URTI)	14	14.7
Urinary tract Infection (UTI)	18	18.9
Septicaemia	9	9.47
Bronchitis	5	5.45

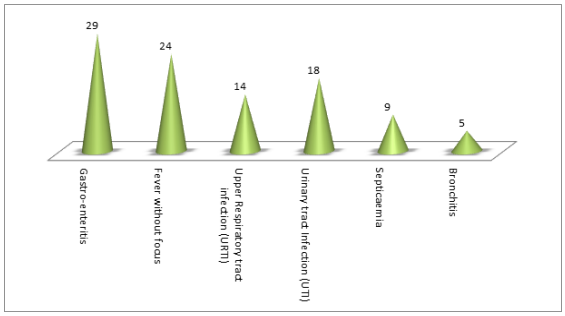

Figure 2: Provisional diagnosis in UTI infants

Table 3: Antibiotic sensitivity of organism growing in Urine Culture samples

Antibiotic	Number	Percentage %
Amikacin	85	89.4
Oflaxacin	69	72.6
Norfloxacin	56	58.9
Gentamicin	39	41.05
Nitrofurantion	16	16.8
Nalidixic Acid	14	14.7
Ceftriaxone	10	10.5
Cefixime	12	12.6
Cefotaxime	0	0.0
Co-triamozole	0	0.0

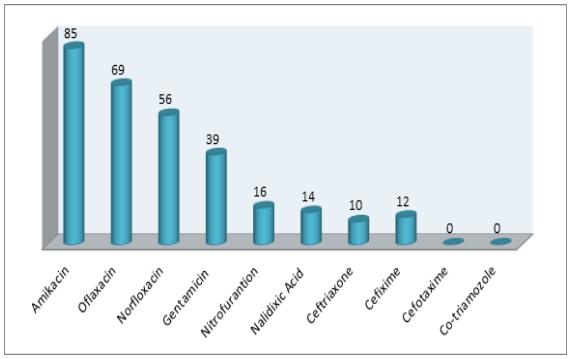

Figure 3: Antibiotic sensitivity of organism growing Urine Culture samples

DISCUSSION

In the present study of UTI infants with acute fever in South Karnataka Population the clinical manifestations were 95 (100%) fever, 36 (37.8%) vomiting, 56 (58.9%) irritability, 67 (70.5%) failure to thrive, 14 (14.7%) jaundice, 20 (21.05%) convulsion [Table 1]. Provisional diagnosis in UTI infants included 29 (30.5%) gastro-enteritis, 24 (25.2%) fever without focus, 14 (14.7%) URTI, 18 (18.9%) UTI, 9 (9.47%) septicaemia, 5 (5.45%) bronchitis [Table 2] The antibiotic sensitivity of organism growing urine culture sample study had 85 (89.4%) Amikacin, 69 (72.6%) oflaxacin, 56 (58.9%) norflaxacin, 39 (41.5%) gentamicin, 16 (16.8%) Nitrofurantoin, 14 (14.7%) Nalidixic acid, 10 (10.5%) ceftriaxone, 12 (12.6%) cefixine [Table 3] These findings are more or less in agreement with previous studies.[7,8,9,10,11,12]

UTI is very important clinical problem and challenge for clinician to diagnose. The infection usually involves polynephritis which affects the renal function in adulthood also hence UTI in infants must not be ignored and treated meticulously The risk of renal parenchymal damage from UTI manifested by subsequent renal scarring is strongly related to age at the time of UTI being highest in infancy and declining markedly with increasing age.[13,14] Renal scarring is associated with the later development of hypertension, preeclampsia, eclampsia and end stage renal disease.[15,16]

It is reported that, urine culture in the diagnostic evaluation of febrile infants < 3 months of age, whose history or physical examination does not suggest serious illness.[10] The present of pyuria, defined as ≥ 5 leukocytes per high-power field, was relatively insensitive indicator of UTI. Had urine culture omitted because of absence of pyuria, nearly half of the UTI's would not have been diagnosed.[17] The presence of bacteruria defined as any number of bacteria per high power field, was more sensitive indicator, but it was not specific enough to identify infants with UTI accurately.[18,19]

It is also observed that, UTI was higher in female children less than 2 years of age but race, or height in temperature was not correlated with UTI, but symptomatic or asymptotic bacteria was higher in white than black girls.[20]

Several studies have reported that, dipslide cultures method to be valid, with standard quantitative cultures used as the gold standard in UTI of urine and supra pubic aspiration was regarded as ideal method for collecting urine specimens, though it is painful but success rate for diagnosing UTI was 23% to 90%.

CONCLUSION

In the present study of UTI with acute fever in infants urine culture was carried out in every patient because urine culture was mandatory investigation in febrile infants because there is no any other alternate sensitive techniques are available for immediately diagnosing UTI in febrile infants and except when the cause of fever in such infants is unequivocal previously, clinician has to alter to the possibility that febrile infants may have UTI and should consider obtaining a urine culture specimen as part of their diagnostic evaluation. This study demands latest techniques to be explored for immediate diagnose of UTI in febrile infants because present urine culture method is time consuming and prolongs the morbidity of patients.

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Limitation of Study

Owing to tertiary location of present study Institution, less number of patients we have limited findings.

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