Original Article

Indian Journal of Trauma and Emergency Pediatrics
Volume 8 Number 2, May - August 2016
DOI: http://dx.doi.org/10.21088/ijtep.2348.9987.8216.9

Incidence of Urinary Tract Infection among Children with Febrile Convulsion

Ajay Bachalapur*, Mamatha, Ramesh K.*****

Abstract

Introduction: Urinary infections may be confined to the urethra, bladder or kidneys, the level of infection being determined by the size of the inoculums of the introduced bacteria, host resistance or defense factors and the virulence factors of the infecting strain. *Methodology:* The data was collected from parents/guardian of children of age group 6 months to 5 years coming to pediatric emergency ward of VIMS, Bellary with Febrile Seizures. *Results:* Among the 9% children who had UTI, 3% were boys and 6% were girls. All patients with UTI had simple FC. Most children with FC and UTI were < 12 months of age. *Conclusion:* Most children with FC and UTI were < 12 months of age.

Keywords: UTI; Children; Febrile Convulsion.

Introduction

Urinary tract infection is defined as growth of a significant number of organisms of a single species in the urine, in the presence of symptoms. Significant bacteriuria is growth with a colony count of $>10^5$/ml of a single species in a mid – stream clean catch urine sample.

According to Sobel et al [1] (1991)urinary tract infections may occasionally be caused by viruses and fungi, the overwhelming majority of urinary tract infections are caused by bacteria.

Urinary infections may be confined to the urethra, bladder or kidneys, the level of infection being determined by the size of the inoculums of the introduced bacteria, host resistance or defense factors and the virulence factors of the infecting strain. These factors also influence the clinical serverity of infection at each anatomic level within the urinary tract.

Most infections are caused by facultative anaerobes that usually originate from the flora of the bowel. Other pathogens such as group B streptococcus, staphylococcus epidermidis and candida albicans, originate in the flora of the vagina or perineal skin in women [2].

Byran CS et a[2](1984) reported, Escherichia coli as the most common urinary pathogen accounting for 85% of community acquired urinary tract infection.

According to Arvind Bagga et al [3] (2000) about 90% of first symptomatic urinary tract infection and 70% of recurrent infection's are due to Excherichia coli. Less commonly, other enteric gram negative bacteria such as proteus or Klebsiella and Staphylococcus saprophyticus are responsible for community – acquired infections.

The distribution of urinary pathogens in hospitalized patients is different, with E.coli accounting for about 50% of infections, and Klebsiella, Enterobacter, Citrobacter, Serratia, Pseudomonas aeruginosa, Providencia, Enterococcus and S.epidemidis accounting for most of the rest [4] Fungal infections occur almost exclusively in hospitalized patients.

According to Sobel et al [1] (1991) indwelling catheters, cross infection, instrumentation of urinary tract, and selection of a resistant bowel and environmental flora by antimicrobial therapeutic agents contribute to altered microbiology of Nosocomial urinary tract infections. The risk for acquiring Nosocomial urinary tract infection due to E.Coli and proteus species generally decreases as the length of hospitilisation increases.

Author Affiliation: *Pediatrician, Senior Specialist, District Hospital, Koppal, Karnataka, India. **Consultant Pediatrician, Rainbow Hospital, Bangalore. ***Associate Professor,VIMS, Bellary, Karnataka, India

Reprint Request: Ramesh K., Associate Professor,Vijayanagar Institute of Medical Sciences (VIMS), Bellary - 583104, Karnataka, India
E-mail: ramspsm@gmail.com

The common clinical manifestations are fever with chills, flank pain and tenderness. Less frequent complaints include nausea, vomiting, abdominal pain and hematuria, dysuria, frequency and urgency.

Methodology

Source of Data

The data was collected from parents/guardian of children of age group 6 months to 5 years coming to pediatric emergency ward of VIMS, Bellary with Febrile Seizures.

Method of collection of data (including sampling procedure if any)

- Study design; Cross sectional study
- Study area; Paediatric Emergency Ward. VIMS. Bellary A Teritary care centre.
- Study period; 01-01-2012 to 01-01-2013
- Study subjects; Children of age group 6 months to 5 years.
- Sample size; 100
- Method of sampling; Non randomized Targeted study.

Inclusion Criteria

- Children in the age group 6 months to 5 years.
- Children with fever >38^{0}C.
- Children with simple or complex febrile seizure.

Exclusion Criteria

- Children >5 years and <6months.
- Children with lab evidence of mening-oencephalitis, know seizure disorder chronic neurological diseases were excluded.

Results

In our study, 9% of children with FC had UTI. Out of the 100 patients admitted because of FC, 52 were boys and 48 were girls. Among the 9% children who had UTI, 3% were boys and 6% were girls. All patients with UTI had simple FC. Most children with FC and UTI were < 12 months of age. The most frequent pathogen causing UTI was E.coli

In our study of 100 children with FS 9% children showed significant pyuria. Among the cases 6% had positive culture growth. Among culture positive UTI'S 66% were <2years of age with a overall frequency of 6% in children <2 years and 6% in children <1 year.

- 54% cases had no PEM.
- 21% cases had Grade I PEM.
- 16% cases had Grade II PEM.

Table 1: Temperature and weight

Parameters	Mean	Standard deviation
Temperature (F^0)	101.85	0.6
Weight(kgs)	10.64	0.9

Table 2: Distribution based on PEM

PEM	Frequency	Percentage
No	54	54%
Grade 1	21	21%
Grade 2	16	16%
Grade 3	09	09%
Grade 4	00	00%
Total	100	100%

Table 3: Distribution based on urine microscopy

Urine microscopy	Frequency	Percentage
Positive	09	09%
Negative	91	91%
Total	100	100%

Table 4: Distribution based on pus cells in microscopy

Pus Cells	Frequency	Percentage
<5 Cells	03	33.33%
5-10 Cells	04	44.44%
>10 Cells	02	22.22%
Total	09	100%

Table 5: Distribution based on Culture

Culture	Frequency	Percentage
Growth	06	06%
No Growth	94	94%
Total	100	100%

Table 6: Distribution based on Isolated organisms

Culture	Frequency	Percentage
E coli	03	50%
Entero	01	16.66%
Proteus	01	16.66%
Citrobacter	01	16.66%
Total	06	100%

Table 7: Distribution based on USG

USG	Frequency	Percentage
Normal	91	91%
Abnormal	09	09%
Total	100	100%

Table 8: Distribution based on USG finding

USG finding	Frequency	Percentage
Cystitis	03	33.33%
B/L HYDN	01	11.11%
BLD cal	01	11.11%
L HYDN	01	11.11%
PUJ obstr	01	11.11%
PUV	01	11.11%
VUR	01	11.11%
Total	09	100%

- 9% cases had Grade III PEM.
- No cases had Grade IV PEM

Discussion

In our study, 9% of children with FC had UTI. Out of the 100 patients admitted because of FC, 52 were boys and 48 were girls. Among the 9% children who had UTI, 3% were boys and 6% were girls. All patients with UTI had simple FC. Most children with FC and UTI were < 12 months of age. The most frequent pathogen causing UTI was E.coli.

Levin and colleagues and Teach and Geil have, respectively, reprted that 9% and 10% of children with FC had UTI[5,6]. However, Mclntyre and colleagues and Lee and Verrier have, respectively, reported that 2% and 3.9% of patients with FC had UTI[7]. The reason for the lower incidence of UTI in their patients could be that they had not performed urine culture tests for all the patients with FC.

In 2005, Hiraoka evaluated 97 children aged 1-24 months with UTI; the resluts showed that 21 children (21.6%) had FC [8]. IN this study, most of the FC patients were girls; while this finding was similar to those of Melntyre and collegues study and Trainer and colleagues', it was different from that of Levine [5,6,8]. The reason for this may be the higher number of uncircumcised boys in the US than in Iran. Circumcision has been known to prevent UTI; this might explain why cases of UTI were more frequent in the US. In our research, most of the patients were between 6 months and 2 years of age. In other studies, most of the patients at risk were less than 3 years of age.

In our study our of 100 children with FS 9% children showed significant pyuria. Among the cases 6% had positive culture growth. Among culture positive UTI'S 66% were <2years of age with a overall frequency of 6% in children <2 years and 6% in children <1 year.

Incidnece of febrile UTI in infants in our study is almost similar to study by Dharnidharaka et al [9] (1993) who reported a incidence of 5.4% in febrile infants.

Overall frequency of UTI in febrile children in our study was 6% in infants in contrast to study conducted by R.K.Kaushal et al (2003) who reported higher frequency 12.3% in infants.

Overall frequency of febrile UTI in infants in our study (9%) was higher compared to report by show K.N et al (1998) from USA who reported prevalence of 3.3% om febrile infants.

Among culture positive cases 50% grew E.coli and 11.11% each of proteus, citrobacter, entero species, which correlates with other studies. Bryan C.S et al

[4] (1984) reported E.coli as the common urinary pathogen in 85% of cases. According to Aravind Bagga et al [3] (2000) 90% of first symptomatic urinary tract infection and 70% recurrence infections were due to E.coli.Hoberman et al (1993) reported as E.coli as the most common bacterium isolated in his study.

Because of economical constraints urine cultures were done only in children who showed significant pyuria which revealed positive culture in 26%. Hence validity of urine examination could not be accurately ascertained.

In our study 66% of children who showed numerous pus cells were culture positive and 22% who showed >pus cells and 44% who showed 5-10pus cells were culture positive and 33% of children showing >5pus cells were culture positive. Hence the presnece of pyuria of >5 leukocytes/HPF in a centrifuged sample is a significant indicator of UTI.

Conclusion

In this study, the relative frequency of UTI among children with FC was 9% and this frequency was higher that the incidence of UTI in girls and boys (3-5% and 1%, respectively). Therefore, we recommend that UTI should be considered as an important cause of FC in children

References

1. Soble JD. Bacterial etiologic agents in pathogenesis of urinary tract infection. Medical Clinics of North America. 1991; 75: 253-269.
2. Bryan CS, Reynolds KL. Community acquired Bacteremic urinal; tract infection: Epidemiology and Outcome. J Urol. 1984; 132: 490, 934.
3. Bagga A, Sharma J. Urinary tract infections clinical features, evaluation and treatment. Pediatr today. 2000; 3: 395-401.
4. Bryan CS, Reynolds KL. Hospital acquired Bacteremic urinary tract infection: Epidemiology and Outcome. J Urol. 1984; 132: 494.
5. Levine D.A, Platt S.L., Macias C G. Clinical & demographic factors associated febrile infant. American Academy of pediatrics. 2005; 116(3): 644-648.
6. Mclntyre PB, Gray SV, Vance JC. Unsuspected bacteria 1 infection in febrile convulsion. Medical journal of Australia. 1990; 152(4): 183-186.
7. Lee P, Verrier Jones K. Urinary Tract Infection in Febrile convulsion. Archives of Disease in Childhood. 1991; 66(11): 1287-1290.
8. Iraoka M. Auditing the management of childhood Urinary Tract Infection in original Hospital. Hong-Kong Journal of Pediatrics. 2005; 10: 180-188.
9. Dharnidharka VR. Prevalence of bacteriuria in febrile infants. Indian Pediatr. 1993; 30: 981-986.