Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 6
Open Access

A Study of Urinary Tract Infection among children with Febrile Convulsions at a Tertiary care Hospital – A Prospective Observational study

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Cite this paper as: Karthik S, Vidya G Mirji, Channakeshvala Srikanth , Bhanuchand P (2024) A Study of Urinary Tract Infection among children with Febrile Convulsions at a Tertiary care Hospital – A Prospective Observational study. Frontiers in Health *Informatics*, *13(6)* 897-900

Abstract

Introduction : Febrile seizures (FS) are seizures occurring in children between age group of 6 -60 months with a temperature of 38°C or higher in a healthy child. **Materials and Methodology:**A prospective observational study was conducted in the Department of Pediatrics. The inclusion criteria was children aged between 6 months to 5 years with temperature of at least 99^0F or above at presentation, and brought to hospital with seizure or had a reliable history of febrile seizure prior to admission. The exclusion criterion was children with a history of unprovoked afebrile seizure, significant neurological abnormality or head trauma.. For all the children who met the inclusion criteria, urine samples were sent for urine examination and culture and sensitivity. **Results :**A total of 115 children were enrolled for the study among which 59 (51.3%) were boys and 56 (48.7%) were girls. Urine analysis done within 24 hours of admission, showed abnormal in 21 cases which accounted to 18.3%. Among them, 15 (71.4%) were girls and 6 (28.6%) were boys. The urine culture for these cases showed growth in 9 (42.9%) cases. Among these 6 (66.7%) cases of E- coli, 2 (22.2%). **Conclusion:** Our study concludes that although FS is relatively common in boys, UTI as a cause of FS is common in girls with E coli being the most common isolate. Hence all children with FS must be evaluated for UTI.

Key words: Febrile seizures (FS), Urinary Tract Infections (UTI)

Introduction

Febrile Seizures (FS) are seizures occurring in children between age group of 6 -60 months with a temperature of 38°C or higher in a healthy child.[1] It is one of the most common neurological findings in children.[2] The sources of infection in children with FS are varied and include upper respiratory tract infections, otitis media, pneumonia, influenza-like diseases, gastroenteritis, and Urinary Tract Infections (UTI) that may present as simple cystitis or pyelonephritis.[3] Primary evaluation of children presenting with FC aims at diagnosing the potential sources of infection, including UTIs.[4] Previous studies on the association between UTI and febrile seizure offer contradictory results.[5] Hence the current study was designed to find the association of UTIs among children with FS admitted at a Tertiary care Hospital.

Materials and Methodology

A prospective observational study was conducted in the Department of Pediatrics after Ethical Committee approval. A written informed consent was taken from the parents or the guardian of the children before enrolling for study. The inclusion criteria was children aged between 6 months to 5 years with temperature of at least 99^0F or above at

presentation, and brought to hospital with seizure or had a reliable history of febrile seizure prior to admission. The exclusion criterion was children with a history of unprovoked afebrile seizure, significant neurological abnormality or head trauma and Parents or Guardians who refused to give consent. For all the children who met the inclusion criteria, urine samples were sent for urine examination and culture and sensitivity along with other relevant investigations. Other data including demographic characteristics, past medical history were collected using a data collection sheet.

Results

A total of 115 children were enrolled for the study among which 59 (51.3%) were boys and 56 (48.7%) were girls. The age distribution is as shown in Table 1, with peak between 1 year to 2 years with 55 (47.8%) cases. Among the 115 children, the first episode of FS was seen in 87 (75.7%) cases and recurrence in 28 (24.3%) cases. Out of 115 children, 93 (80.9%) had simple FS and 22 (19.1%) had complex FS.

Table 1: Socio-demographics (n = 115)

Sex distribution	**No of cases**	**Percentage**
Boys	59	51.3%
Girls	56	48.7%
Age distribution	**No of cases**	**Percentage**
6 months to 1 year	10	8.7%
1 year to 2 years	55	47.8%
2 years to 3 years	32	27.8%
3 years to 4 years	13	11.3%
4 years to 5 years	5	4.4%
Frequency of seizures	**No of cases**	**Percentage**
First episode	87	75.7%
Recurrence	28	24.3%
Type of seizures	**No of cases**	**Percentage**
Simple FS	93	80.9%
Complex FS	22	19.1%

Urine analysis done within 24 hours of admission, showed abnormal in 21 cases which accounted to 18.3%. Among them, 15 (71.4%) were girls and 6 (28.6%) were boys. The p-value was 0.0291, showing that abnormal urine analysis was statistically significant among girls. 13(61.8%) were in the age group of 1 year to 2 years, 5 (23.8%) between 2 years to 3 years. Among the 6 boys none of them had undergone circumcision. Out the 21 cases, 18 (85.7%) had simple FS and 3(14.3%) had complex FS. 5 (23.8%) of cases had anatomical abnormalities of genital tract.

Table 2: Urine analysis report (n = 115)

Gender	**Abnormal**	**Normal**	**p-value**
Boys	06	53	0.0291*
Girls	15	41	
Age distribution	**Abnormal**	**Normal**	**p-value**
6 months to 1 year	01	09	0.617
1 year to 2 years	13	42	
2 years to 3 years	05	27	

3 years to 4 years	01	12	
4 years to 5 years	01	4	
Type of seizures	**Abnormal**	**Normal**	**p-value**
Simple FS	18	75	0.532
Complex FS	03	19	
*Significant p-value if <0.05			

The urine culture for these cases showed growth in 9 (42.9%) cases. Among these 6 (66.7%) cases of E- coli, 2 (22.2%) had growth of Klebsiella and 1(11.1%) had growth of Proteus. Among the culture positive cases 7 (77.8%) were girls and 2 (22.2%) were boys. 5(55.6%) were in the age group of 1 year to 2 years, 2 (22.2%) between 2 years to 3 years and 1 (11.1%) between 6 months to 1 year and 1 (11.1%) between 4 years to 5 years. Out the 9 cases, 8 (88.9%) had simple FS and 1(11.1%) had complex FS. 2 (22.2%) of cases had anatomical abnormalities of genital tract.

Table 3: Urine culture report among the abnormal Urine analysis children (n = 21)

Gender	**Culture positive**	**Culture Negative**	**p-value**
Girls	7	8	0.576
Boys	2	4	
Age distribution	**Culture positive**	**Culture Negative**	**p-value**
6 months to 1 year	01	00	0.617
1 year to 2 years	05	08	
2 years to 3 years	02	03	
3 years to 4 years	00	01	
4 years to 5 years	01	00	
Type of seizures	**Culture positive**	**Culture Negative**	**p-value**
Simple FS	8	10	0.576
Complex FS	1	02	

Discussion

The seizure has many different effects on patients. Its likely complications include the reduction of learning and academic failure, poor social communication etc. It also affects the quality of life of children due to its physical effects including excessive fatigue that impedes effective social and learning activities. On the other hand, UTI is one of the most common infections in childhood that brings discomfort to the child, concern for parents, and permanent damage to the kidney. Approximately 15% of children with UTIs develop renal scarring 1 to 2 years after the infection. For this reason, the diagnosis of UTIs in children is highly important.[6] For this reason, it is important to pay attention to the prevention of febrile seizure and UTI.[7]

On comparing the socio-demographics it was similar to study done by Pant D et al.[1] and Güneş A et al.[2] as shown in table 4.

Table 4: Comparison of Socio-demographics.

Sex distribution	**Present study**	**Pant D et al.[1]**	**Güneş A et al.[2]**
Boys	51.3%	58.12%	59.9%

Girls	48.7%	41.88	40.1%
Frequency of seizures			
First episode	75.7%	76%	78.8%
Recurrence	24.3%	24%	21.2%
Type of seizures			
Simple FS	80.9%	70.4%	83.9%
Complex FS	19.1%	29.6%	16.1%

In the present study urine examination was abnormal in 18.26% which was similar to study done by Momen AA et al.[3] which accounted to 17.5%. On comparing the incidence of Culture positive UTI, In the present study 7.8% of the children had UTI, when compared to 6.4% by Pant D et al.[1], 6.6% by Momen AA et al.[3] and 11.1% by Abedi A et al.[4]. In the present study major culture isolate was E coli which accounted to 66.7%, but in study by Momen AA et al.[3] was E coli accounted to 88.9%.

Conclusion

Our study concludes that although FS is relatively common in boys, UTI as a cause of FS is common in girls with E coli being the most common isolate. Hence all children with FS must be evaluated for UTI.

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