

Determinants of Febrile Convulsion among Children

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Abstract

Introduction: The sources of infection in children with FC are varied and include upper respiratory tract infections, otitis media, pneumonia, influenza-like diseases, gastroenteritis, and urinary tract infection (UTI) that may present as simple cystitis or pyelonephritis. *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:* In this study Upper respiratory tract infections (URTI) and urinary tract infection (UTI) is more common among children of age group 6-12 months as a cause for febrile seizure as compared to other age groups. *Conclusion:* Lower respiratory tract infection (LRTI) is more common in age group 49-60 months as a cause for febrile seizure.

Keywords: Urinary Tract Infection; LRTI; Febrile Seizures.

Introduction

FS are the most common form of childhood seizures. The peak incidence is at the age of approximately 18 months. Nelson and Ellenberg found the average age of FS to be 23.3 months. In the United States and Western Europe, they occur in 2% to 4% of all children [1,2,3]. In Japan, however 9% to 10% of all children experience at least one FS and rates as high as 14% have been reported from the Mariana Islands in Guam [4].

Recent studies, however, found that only 21% of the children experienced their seizure either before or within 1 hour of the onset of fever, 57% had seizure after 1 to 24 hours of fever, and 22% experienced their FS more than 24 hours after the onset of the fever [5].

Bethune and associates found out that the following four risk factors were associated with an increased risk of FS:

1. A history of FS in a first or second degree relative.
2. A neonatal nursery stay of more than 30 days,

3. Developmental delay, or
4. Attendance at day care.

Children with two of this factor had a 285 chance of experiencing at least one FS [6].

The majority of FS are simple seizures. Berg and Shinnar found that 35% had at least one complex feature, including focality in 16%, multiple seizures in 14%, and prolonged duration longer than 10 minutes in 13%. Approximately 6% of children had at least two complex features, and 1% had all three complex features. It was found that 14% of children had seizures longer than 10 minutes, 9% longer than 15 minutes, and 5% longer than 30 minutes, or febrile status epilepticus⁷.

The sources of infection in children with FC are varied and include upper respiratory tract infections, otitis media, pneumonia, influenza-like diseases, gastroenteritis, and urinary tract infection (UTI) that may present as simple cystitis or pyelonephritis. The signs and symptoms of UTI in children are different and depend on their age. The frequency of fever in UTI is as follows: neonatal period, 11%; 1-24 months,

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38%; 2-5 years, 57%; and 5-12 years, 50%. The frequency of seizure as a sign of UTI is as follows: neonatal period, 2%; 1-24 months, 7%; 2-5 years, 9%; and 5-12 years, 5% [8].

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.
- Study design; Cross sectional study
- Study area; Paediatric Emergency Ward. VIMS. Bellary, A Tertiary care centre.
- Study subjects; Children of age group 6 months to 5 years.

Results

Table 1: Distribution based on diagnosis

Diagnosis	Frequency	Percentage
URTI	61	61%
UTI	09	09%
LRTI	13	13%
Dengue	11	11%
Chicken Pox	02	02%
Measles	01	01%
Otitis media	01	01%
Abscess	01	01%
Vaccination	01	01%
Total	100	100%

Table 2: Relation between age and diagnosis

Age group	URTI	UTI	Diagnosis LRTI	Dengue	Others	Total
6 - 12 months	26 (61.9%)	04(21.4%)	03 (07.1%)	03 (07.1%)	01 (02.4%)	37 (100%)
13 - 24 months	15 (60.0%)	03(12.0%)	01(04.0%)	03 (12.0%)	03 (12.0%)	25 (100%)
25 - 36 months	07 (43.7%)	02(12.5%)	02 (12.5%)	03 (18.7%)	02 (12.5%)	16 (100%)
37 - 48 months	06 (60.0%)	00	03 (30.0%)	01 (10.0%)	00	10 (100%)
49 - 60 months	07 (58.3%)	00	04(33.3%)	01 (8.3%)	00	12 (100%)
Total	61 (61%)	09(09%)	13 (13%)	11 (11%)	06 (06%)	100 (100%)

P value <0.05

In this study urti and uti is more common among children of age group 6-12 months as a cause for febrile seizure as compared to other age groups.

- 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°C.
- Children with simple or complex febrile seizure.

Exclusion Criteria

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

LRTI is more common in age group 49-60months as a cause for febrile seizure.

Table 3: Relation between sex and diagnosis

Sex	URTI	UTI	Diagnosis LRTI	Dengue	Others	Total
Male	37 (55.2%)	04 (15.5%)	07 (12.1%)	07 (12.1%)	03 (05.2%)	58 (100%)
Female	24 (57.1%)	05 (11.9%)	06 (14.3%)	04 (09.5%)	03 (07.1%)	42(100%)
Total	61 (61%)	09 (09%)	13 (13%)	11 (11%)	06(06%)	100 (100%)

P value <0.05

Table 4: Relation between diagnosis and average length of seizure

Diagnosis	Length of seizure			Percentage
	<5 mins	5-10 mins	>10 mins	
URTI	48 (78.68%)	12 (19.67%)	01 (01.63%)	61(100%)
UTI	09 (100.0%)	00	00	09(100%)
LRTI	09 (69.2%)	02 (15.4%)	02 (15.4%)	13(100%)
Dengue	07 (63.6%)	03 (27.3%)	01 (09.1%)	11(100%)
Chicken Pox	01 (50.0%)	01 (50.0%)	00	02(100%)
Measles	00	01(100%)	00	01(100%)
Otitis media	01 (100%)	00	00	01(100%)
Abscess	00	01 (100%)	00	01(100%)
Vaccination	01 (100%)	00	00	01(100%)
Total	76 (76%)	20 (20%)	04 (04%)	100 (100%)

P value <0.05

Table 5: Relation between diagnosis and type of seizure

Diagnosis	Type of seizure		Percentage
	GTT	Focal	
URTI	53 (85.7%)	08 (14.3%)	61(100%)
UTI	09 (100%)	00	09(100%)
LRTI	11 (84.6%)	02 (15.4%)	13(100%)
Dengue	10 (90.0%)	01 (09.1%)	11(100%)
Chicken Pox	02 (100%)	00	02(100%)
Measles	01 (100%)	00	01(100%)
Otitis media	01 (100%)	00	01(100%)
Abscess	01 (100%)	00	01(100%)
Vaccination	01 (100%)	00	01(100%)
Total	89 (89.0%)	11 (11.0%)	100 (100%)

P value <0.05

Table 6: Relation between age and average length of seizure

Diagnosis	Length of seizure			Percentage
	<5 mins	5-10 mins	>10 mins	
6 - 12 months	34 (88.1%)	03 (07.2%)	00 (04.7%)	37(100%)
13 - 24 months	22 (88.0%)	03 (12.0%)	00	25(100%)
25 - 36 months	08 (50.0%)	05 (31.2%)	03 (18.8%)	16(100%)
37 - 48 months	03 (30.0%)	07 (70.0%)	00	10(100%)
49 - 60 months	09 (57.1%)	02 (28.6%)	01 (14.3%)	12(100%)
Total	76 (74%)	20 (20%)	04 (06%)	100(100%)

P value <0.05

Table 7: Relation between Age and type of seizure

Age group	Type of seizure		Percentage
	GTT	Focal	
6 - 12 months	33 (89.1%)	04 (14.3%)	37(100%)
13 - 24 months	22 (88.0%)	03 (12.0%)	25(100%)
25 - 36 months	16 (100%)	00	16(100%)
37 - 48 months	08 (80.0%)	02 (02.0%)	10(100%)
49 - 60 months	10 (100%)	02	12(100%)
Total	89 (89.0%)	11 (11.0%)	100(100%)

P value <0.05

Discussion

Upper respiratory tract infection is the commonest trigger of febrile seizure in present group of children. This is in keeping with Nelson and Ellenberg (1978), Millichap et al (2006) and Kyong KL et al. Chevirie and A Aicardi et al (1975) reported URTI in 72% of the cases and Azhar S Daoud et al from Jordan,

reported URTI as the commonest triggering factor, diagnosed in 53% of cases, which is comparable to present study. However the etiology of febrile convulsion varies from country to country due to different infection profile.

In this study, UTI among children with FC was 9% and the result is comparable with the study done by moment et al which showed 6.6% UTI children had FS.

URTI	Vaccinations
Nelson and Ellenberg	Offringa et al
Millichap et al.	Hertz and Nelson et al.
Kyong KL et al	
Chevrie and Aicardi et al	
Dauod AS et al	
Present study	

Recent Vaccination

In literature receipt of diphtheria, whole-cell pertussis and tetanus toxoid vaccine; and measles, mumps, and rubella vaccine has been reported to be associated with a transiently increased risk of a FS on the day of vaccination and 8-14 days after vaccination respectively as shown by Offringa et al [9] and Millichap et al. According to Hertz and Nelson vaccination constitutes only 2.2% of the febrile seizure. In present study 1% of children following vaccination had FS.

Conclusion

Among the range of triggering illnesses URTI predominated the cases.

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