

Original Research Article

Socio-demographic risk factors associated with febrile seizures at Puducherry: a retrospective study

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ABSTRACT

Background: Febrile seizures occur commonly in the under 5 age group and is associated with few risk factors causing its recurrence like very high fever, family history of seizures, low sodium levels and younger age of onset which are subject to seasonal and wide geographical variations. This study aimed at detecting the major risk factors associated with recurrent febrile seizures in an Indian population.

Methods: A retrospective hospital-based study was conducted among a total of 300 cases aged 6 months to 5 years attending to the paediatric OPD with history of fever followed by febrile seizures. Information regarding socio-demographic and clinical variables associated with febrile seizure was collected and analyzed.

Results: The mean age of the study participants was 25.6±2.2 months and majority (60%) were males. Family history of seizures was present in 25.3% (n=76) of the children with febrile seizures. Respiratory infections (73.3%) and gastroenteritis (17%) were the major infective reasons associated with the occurrence of febrile seizures followed by pneumonia (6.3%) and urinary tract infections (5%). Recurrence of FS was significantly higher among the children with family history of FS (p=0.009), age at onset lesser (p<0.001) and simple FS seizures.

Conclusions: Younger age at onset and positive family history of seizures were important socio-demographic risk factors associated with recurrent febrile seizures.

Keywords: Family history, Febrile seizures, Recurrent febrile seizures, Socio-demographic factors

INTRODUCTION

Febrile seizure is defined as “an event in infancy or early childhood, usually occurring between three months and five years of age, associated with fever, but without evidence of intracranial infection or defined cause and not suffered a previous non-febrile seizure.¹” Febrile seizure is the common type of convulsive disorder in the 6 months to 5 years age group affecting at least 2-5% in that age group.²

Most of the febrile seizures reported in the under five years age group are idiopathic yet some associated morbidities listed by various researchers include fever,

hypoglycaemia, respiratory infection or gastroenteritis, epilepsy, hypocalcaemia, head injury, poisoning and overuse drugs.³ Although febrile seizure is a threatening term for the parents, there exists no evidence of residual effects of the condition with a risk for recurrent epilepsy less than 1%.^{4,5}

The most important risk factors identified include very high fever, family history of seizures, low sodium levels, neonatal discharge ≥ 28 days and delayed developmental milestones.¹ There exists seasonal and demographic/geographical variations in the occurrence of febrile seizures and hence this study attempts to study the socio-demographic risk factors associated with febrile seizures.

METHODS

This retrospective study was conducted among the children in the age group of 6 months–5 years who attended the out-patient and in-patient units of the department of Paediatrics of Sri Venkateshwarra Medical College Hospital and Research Center, Ariyur, Puducherry, during January 2018 to January 2020 (2 years).

The study was conducted after getting the approval of the ethical committee of the institution.

Inclusion criteria

A total of 300 cases aged 6 months to 5 years attending to the paediatric OPD with history of fever followed by febrile seizures were included.

Exclusion criteria

Those children with age less than six months and age five years or greater, with evidence of any central nervous system infection or electrolyte imbalances, prior history seizures without fever and previously documented structural abnormalities of the nervous system were excluded. A semi-structured proforma was used to collect details regarding socio-demographic and clinical characteristics of the study participants. Standard protocols were followed for anthropometric measurements and temperature recordings.

Statistical analysis

Data entry and analysis was done using SPSS version 20.0. Discrete variables are expressed as counts (%) and compared using Chi-square tests. Continuous variables are expressed as mean±SD and compared by means of the unpaired, two-sided t test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 300 children were included in the study among which majority were males (n=180, 60%) and rest females (n=120, 40%). The mean age of the study participants was 25.6±2.2 months. The socio-demographic and clinical variables of the study subjects are given in Table 1. Family history of seizures was present in 25.3% (n=76) of the children with febrile seizures. History of premature delivery (n=10, 3.3%), anemia (n=66, 22%) and co-morbid developmental delays (n=7, 2.3%) were noted among the children with febrile seizures. The summary of infections associated with febrile seizures is given in Table 2.

Respiratory infections (73.3%) and gastroenteritis (17%) were the major infective reasons associated with the occurrence of febrile seizures followed by pneumonia (6.3%) and urinary tract infections (5%). Various risk

factors were associated with the incidence of FS recurrence among which younger age at onset of FS and positive family history of seizures were significantly associated with FS. (Table 3) There was a significant increased recurrence of FS among the children with family history of FS (p=0.009), age at onset lesser (p<0.001) and simple FS seizures.

Table 1: Demographic/ clinical variables of subjects with febrile seizures (FS) (n=300).

Clinico-social variables	
Age of onset of FS, Mean±SD	1.78±0.4
Gender	
Male, n (%)	180 (60)
Female, n (%)	120 (40)
Type of FS	
Simple FS	276 (92)
Complex FS	24 (8)
Family history of seizures	28 (22.6)
Recurrence of FS	
First FS without recurrence	220(73.3)
First FS with recurrence	56 (18.7)
Recurrent FS	24 (8)
Mean number of FS episodes, Mean±SD	3.14±1.2
Mean temperature at admission, Mean±SD	39.1±1.0
Mean time of fever before FS (hr), Mean±SD	25.4±3.8
Mean duration of FS (min), Mean±SD	2.5±3.3
Subsequent epilepsy	4 (1.3)

Table 2: Infections associated with febrile seizures (n=300).

Associated infections	n (%)
Upper respiratory tract infection	220 (73.3)
Pneumonia	19 (6.3)
Urinary tract infection	15 (5.0)
Acute bronchitis	5 (1.7)
Acute gastroenteritis	51 (17.0)
Acute otitis media	12 (4.0)
Occult bacteremia	10 (3.3)
Viral croup	5 (1.7)
Others	10 (3.3)

DISCUSSION

Febrile seizures are a nightmare for the parents when it first happens to the child despite the sequence of events being harmless in majority of the cases. In the present study, the age at onset of febrile seizure is 1.78±0.4 years. This was similar to the study by Kantamalee et al, in which the mean age at onset of febrile seizure was 1.85±0.95 years.

Similar studies by Esmaili et al, and Hussain et al, who reported age of onset at 22.58±15.4 and 22.58±12.50 months respectively.⁶⁻⁸ In the present study, family

history of seizures was present among 22.6% of the study subjects with febrile seizures which was similar in line to

the previous study in which 25.07% of the included children had positive family history of febrile seizures.⁶

Table 3: Risk factors associated with recurrence of febrile seizures (n=300).

Risk factors	FS with recurrence n =56	FS without recurrence n= 244	OR (95% CI)	p value
Age at onset (mean±SD)	1.2±0.3	1.9±0.5		<0.001
Temperature at admission (mean±SD)	38.4±0.8	38.6±0.4		0.07
Fever duration before FS (hr) (mean±SD)	24.6±3.1	25.7±5.8		0.19
FS duration (min) (mean±SD)	2.8±1.8	2.6±1.2		0.32
Gender, n (%)				
Male	34 (60.7)	146 (59.8)	1.04 (0.57, 1.9)	0.91
Female	22 (39.3)	98 (40.2)		
Type of FS, n (%)				
Simple	45 (80.4)	231 (94.7)	0.39 (0.16, 0.9)	0.03
Complex	8 (14.3)	16 (6.6)		
Family history of FS, n (%)				
Positive	20 (35.7)	48 (19.7)	2.3 (1.2, 4.3)	0.009
Negative	36 (64.3)	196 (80.3)		

The study by Javadi et al, showed that the family history of febrile seizures was 9.5% which was very less compared to the present study.⁹ This may signify the differences in genetic factors, ethnicity and geographical variations in percolation of the pathology over generations. The major infections associated with febrile seizures in the present study included respiratory infections (73.3%) and gastroenteritis (17%) followed by pneumonia (6.3%) and urinary tract infections (5%). A similar proportion was estimated by the previous similar study which showed the major infective etiology included respiratory tract infection (62.30%), followed by acute gastroenteritis (12.24%).⁶ Similar results were recorded by Esmaili et al, and Hussain et al, in their studies on causative influence of febrile seizures.^{7,8} In the present study recurrence of FS could be significantly associated with lower age of onset and family history of seizures. There was no difference in mean temperature at admission between recurrent and the non-recurrence group. The study by Van et al, and Berg et al, showed that there is a lesser seizure threshold and more recurrence when the temperature at onset was lesser. But such variability was not recorded in the present study.^{10,11}

The study had few limitations of being a retrospective study and not being able to retrieve detailed history about previous seizure episodes and family history.

CONCLUSION

The study depicted that the younger age at onset and positive family history of seizures were important socio-demographic risk factors associated with recurrent febrile

seizures. Hence the treating paediatrician should ask for such history in determining the risk of further sequence of management.

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