

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## A Clinical Study of Febrile Seizures in Children in a Tertiary Care Hospital.

Viswanatha Kumar HM, Ananda Kumar TS, and Kumar GV\*.

Department of Paediatrics, Sri Siddhartha Medical College, Tumkur, Karnataka, India.

### ABSTRACT

A child with a febrile seizure is one of the more common causes of admission to a paediatric ward. Febrile seizures are the most common type of seizures seen in 2-5% of children aged below 5 years. The incidence and prevalence of febrile seizure is similar across the numerous febrile seizure studies. Although febrile seizure is known to have a genetic basis, mode of inheritance is not yet clear. There are three types of febrile seizures: simple febrile seizure, complex febrile seizure and febrile status epilepticus. This was an observational study conducted in the department of paediatrics on children between 6 months to 5 years of age having convulsions, associated with fever but without the evidence of intracranial infection. Out of 5783 children admitted in the paediatric wards 100 children were diagnosed to have febrile seizures accounting to the incidence of 17.29/1000. Out of 100 children with febrile seizures 55 were males and 45 were female children. In these children 69 children had typical febrile seizures and 31 children had atypical febrile seizures. In these children 92 children had generalised seizures, 6 children had focal seizures and 2 children had hemiconvulsions. Out of these cases 68% of the cases occurred below 2 years of age. Most of the children 69% had single episode of seizure per febrile episode. A few children 8% of the children had more than 4 episode of seizure in the present febrile episode. In our study 70% of the children had convulsions within 24hrs of onset of fever. In this study 87% of the cases had no family history of convulsions, 7% had history of convulsions in the siblings, 2% had history of convulsions in the parents and 4% had history of convulsions in the second degree relatives. Respiratory tract infections were the commonest cause of fever in febrile convulsions about 78%. Though upper respiratory tract infection is the most common underlying cause for fever in children with febrile seizures other treatable causes like lower respiratory tract infections, acute gastroenteritis, urinary tract infections and other viral infections should be kept in mind. Education and reassurance of the parents is the cornerstone of management and follow-up for this disorder.

**Keywords:** simple febrile seizures, complex febrile seizures, respiratory tract infections

*\*Corresponding author*

**INTRODUCTION**

A child with a febrile seizure is one of the more common causes of admission to a paediatric ward. The international league against epilepsy (ILAE) defines a febrile seizure as “a seizure occurring in childhood after one month of age, associated with a febrile illness not caused by an infection of the central nervous system, without previous neonatal seizures or a previous unprovoked seizure, and not meeting criteria for other acute symptomatic seizures”[1]. The consensus statement published by the national institute of health (NIH) is similar to the ILAE definition, except for a lower age limit in the latter, when compared to the NIH lower age limit of 3 months [1]. Febrile seizures are the most common type of seizures seen in 2-5% of children aged below 5 years [2]. The incidence and prevalence of febrile seizure is similar across the numerous febrile seizure studies. There is variation of incidence of febrile seizure based on geographic location, with higher prevalence found in Japan and Guam [3-5]. In India the prevalence of febrile seizure is around 8%. Although febrile seizure is known to have a genetic basis, mode of inheritance is not yet clear. Various genetic models including multifactorial inheritance, autosomal dominant inheritance with incomplete penetration or polygenic inheritance have been proposed [6].

There are three types of febrile seizures: simple febrile seizure, complex febrile seizure and febrile status epilepticus. Recurrence is common and average risk of recurrence is around 30-40% [7]. The major risk factors for the recurrence are the first febrile seizures below 15months of age, positive family history and a complex type of first seizure. Febrile seizure is a benign condition and the prognosis is good. Here we conducted this study to assess the clinical, epidemiological and laboratory characteristics of febrile seizures in children.

**MATERIALS AND METHODS**

This was an observational study conducted in the department of paediatrics Sri Siddhartha Medical College, Tumkur, Karnataka, India, for a period of one year. Children between 6 months to 5 years of age having convulsions, associated with fever but without the evidence of intracranial infection were included in the study. Children with a known seizure disorder, underlying chronic neurologic condition, metabolic abnormalities were excluded from the study. A detailed history was taken and through clinical examination was done and the findings were documented in the pre prepared Performa. Necessary lab investigations were done. The results were analysed.

**RESULTS**

Out of 5783 children admitted in the paediatric wards 100 children were diagnosed to have febrile seizures accounting to the incidence of 17.29/1000. Out of 100 children with febrile seizures 55 were males and 45 were female children. In these children 69 children had typical febrile seizures and 31 children had atypical febrile seizures (table-1). In these children 92 children had generalised seizures, 6 children had focal seizures and 2 children had hemiconvulsions. Out of these cases 68% of the cases occurred below 2 years of age.

**Table 1: Age and sex distribution of febrile seizures**

Age group	Typical febrile seizures			Atypical febrile seizures		
	Male	Female	Total	Male	Female	Total
6mo -1 yr	17	10	27	04	03	07
1yr – 2 yr	07	13	20	09	05	14
2yr – 3yr	06	06	12	03	02	05
3yr – 4yr	04	02	06	03	01	04
4 yr – 5yr	01	03	04	01	00	01
Total	35	34	69	20	11	31

Most of the children 69% had single episode of seizure per febrile episode. A few children 8% of the children had more than 4 episode of seizure in the present febrile episode. In our study 70% of the children had convulsions within 24hrs of onset of fever (table-2). In this study 69% of the cases had only one episode of convulsions. Majority of the cases ie, 92% had generalised convulsions, 6% had focal convulsions and 2% had

hemiconvulsions. In this study 87% of the cases had no family history of convulsions, 7% had history of convulsions in the siblings, 2% had history of convulsions in the parents and 4% had history of convulsions in the second degree relatives. Respiratory tract infections were the commonest cause of fever in febrile convulsions about 78% (table-3)

**Table 2: Duration of fever and onset of convulsions**

Duration of fever	No of cases	Percentage
< 6 hrs	20	20%
6-12 hrs	15	15%
12-24 hrs	35	35%
24-36 hrs	20	20%
> 36hrs	10	10%

**Table 3: Causes of fever in febrile convulsions**

Type of infection	No of cases	Percentage
Upper respiratory tract infection	58	58%
Bronchiolitis	10	10%
Otitis media	7	7%
Bronchopneumonia	3	3%
Acute gastroenteritis	11	11%
Measles	2	2%
Post- vaccinal	4	4%
Urinary tract infection	5	5%

Biochemical, haematological investigations and lumbar puncture for cerebrospinal fluid were performed when indicated clinically as per guidelines. Blood counts and serum electrolytes were not found to be statistically significant in children with febrile seizures. Hypoglycaemia was not documented in any of the cases of febrile convulsions. Cerebrospinal fluid analysis was normal in children with febrile convulsions.

### DISCUSSION

Simple febrile seizure is more common than complex febrile seizure in different studies worldwide [8, 9]. While a study from Nepal showed simple febrile seizure and complex febrile seizure in 80% and 20% of children respectively this was comparable to our study [10]. Febrile convulsion incidence among children younger than 5 years of age in Europe and the United States of America is around 2-4%. This rate goes up to 14% in Asian countries [11]. In the present study the incidence is 17.29. In many studies, boys were shown to have febrile convulsions more frequently than girls with a 1.1-2.4:1 [12]. Similar pattern is observed in the present study. Majority of children in this study had single episode of seizures which was similar to the previous studies [13, 14]. In the present study 70% of the children had febrile seizures within 24hrs of the onset of fever. Upper respiratory tract infection is the most frequent cause of fever in our children with febrile seizures followed by bronchiolitis and otitis media, which is similar to other studies [15, 16]. Family history of febrile seizures was found in 35% of the children studied by Essam J.Al-Zwaini [17], while this was 13% in the present study.

### CONCLUSION

Simple febrile seizures were the most common type of febrile seizure and predominantly affected children below 2 years of age. Though upper respiratory tract infection is the most common underlying cause for fever in children with febrile seizures other treatable causes like lower respiratory tract infections, acute gastroenteritis, urinary tract infections and other viral infections should be kept in mind. Febrile seizure is a common benign disorder and often resolves spontaneously. Education and reassurance of the parents is the cornerstone of management and follow-up for this disorder.

### REFERENCES

[1] Waruiru C, Appleton R. Arch Dis Childhood 2004; 89(8):751-6.

- [2] Duffner PK, Berman PH, Baumann RJ, Fisher PG, Green JL, Schneider S, et al. *Pediatrics* 2011; 127(2):389-94.
- [3] Mathai KV, Dunn DP, Kurland LT, Reeder FA. *Epilepsia* 1968; 9: 77-85.
- [4] Stanhope JM, Brody JA, Brink E, Morris CE. *Am J Epidemiol* 1972; 95: 299-304.
- [5] Tsuboi T. *Neurol* 1984; 34:175-181.
- [6] Rich SS, Annegers JF, Hauser WA, Anderson VE. *Am J Hum Genet* 1987; 41:249-57.
- [7] Farwell JR, Blackner G, Sulzbacher S, Adelman L, Voeller M. *Clin Pediatr (Phila)* 1994; 33: 263-67.
- [8] Mustafic N, Tahirovic H, Trnovcervic J, Kapidzic A. *Acta Med Croatica* 2008;62(5):511-5
- [9] Chung B, Wat LC, Wong V. *Pediatr Neurol* 2006; 34(2):121-6.
- [10] Ojha AR, Shakya KN, Aryal UR. *J Nepal Paediatr Soc* 2012; 32(1):33-6.
- [11] Hauser WA. *Epilepsia* 1994; 35 Suppl 2: S1-6.
- [12] *Paediatrics* 2008; 121: 1281-6.
- [13] Winkler AS, Tluway A, Schmutzhard E. *J Trop Pediatr* 2013;59(4):298-304.
- [14] Deng CT, Zulkifi HI, Azizi BHO. *Med J Malaysia* 1994; 49(4): 341-7.
- [15] Aygun AD, Guvenc H, Koc A. *T Klin Pediatr* 1995; 4: 16-9
- [16] Aydin OF, Senbil N, Kara C, Bozkurt C, Gurer YKY. *Ankara Universitesi Tip Fakultesi Mecmuasi* 2000; 53: 231-5.
- [17] Al-Zwaini EJ. *J Pediatr Neurol*. 2007; 5(4): 311-15.