



P-ISSN: 2664-3685
E-ISSN: 2664-3693
www.paediatricjournal.com
IJPG 2019; 2(2): 126-129
Received: 18-11-2019
Accepted: 22-12-2019

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Febrile seizures prevalence in children

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DOI: <https://doi.org/10.33545/26643685.2019.v2.i2b.48>

Abstract

Introduction: The prevalence of febrile seizures in children is around 2% to 5% and in general they resolve completely and have excellent prognosis. They necessitate hospital admission so as to rule out other causes of seizures.

Aim of the study: To study the prevalence of febrile seizures in children in one month to six years of age.

Materials and methods: This was a prospective hospital based observational study in which children aged one month to six years, admitted for febrile seizures were studied. The patient demographics, prevalence of seizures, types of seizures and the likely source of infection was looked for.

Results: There were a total of 62 patients in the specified age group. The male to female ratio was 1.5:1. Most number of the cases (50%) were seen in the 1 month to 2 years of age group. Typical febrile seizures (66.1%) were common than the atypical ones (33.8%). History of recurrent seizure was present in 11 (17.7%) cases. Febrile seizures were most common (33.8%) in the cases admitted for upper respiratory tract infections.

Conclusion: Simple febrile seizure is a common self-limiting disorder in young children and often has spontaneous resolution. It may recur in a few cases. Patient admission to rule out other causes of seizures, creating awareness in parents and counselling for regular follow up are important.

Keywords: Prevalence of seizures in children, simple seizure, febrile seizures in 1 month to 6 years, recurrent seizures

Introduction

Febrile seizures are common in young children and cause much concern in the parents. They are also a common reason for hospital admission so as to undertake complete evaluation of the patient. The prevalence of febrile seizures in children is around 2% to 5% and in general they resolve completely and have excellent prognosis^[1].

These seizures are broadly divided into simple type and complex type. The simple ones usually last 10 to 15 minutes they could be generalized tonic clonic, tonic or clonic or atonic. They do not have any postictal phase and do not recur in the first 24 hours. On the other hand, complex febrile seizures are of longer duration, have postictal phase, can recur in the first 24 hours and may also have focal neurological deficit^[2].

Many times seizures in children are due to non-CNS causes like high fever, various infections, hypoxic conditions, electrolyte imbalances, hypoglycemia, toxins or metabolic disorders. Epilepsy is also an important cause for seizures in children. More ominous are seizures related to neoplastic or non-neoplastic space occupying lesions in the brain. Hence, a complete workup is required for such cases^[3].

American Academy of Pediatrics (AAP) has defined a febrile seizure as a seizure accompanied by fever (Temperature 100.4 °F or 38 °C by any method), without central nervous system infection, that occurs in infants and children 6 through 60 months of age.

In general febrile convulsion have good outcome and improve with the age of the child. There is usually no risk of subsequent epilepsy or neurological abnormalities. The cognitive and scholastic abilities of the children are well-maintained and not affected by febrile seizures or by the treatment given for these seizures^[4].

In the present study we have attempted to look at the prevalence of febrile seizures in children aged one month to six years in our local population.

Aim of the study: To study the prevalence of febrile seizures in children in one month to six years of age.

Materials and Methods

This was a prospective, hospital based observational, study done in the department of

Paediatrics at -----Institute over a period of fifteen months from -----to -----.

Inclusion criteria

Children aged 1 month to 6 years
Children with febrile seizures

Exclusion criteria

Children less than 1 year and above 6 years
Nonfebrile seizures

The cases admitted to paediatrics ward and paediatrics ICU with clinical diagnosis of febrile seizures were selected for the study. A detailed clinical history with special emphasis on duration and type of seizures, recurrent history of seizures, drug history, family history, any focus of infections, etc. was noted. This was followed by complete general and systemic examination.

Routine investigations like complete blood picture (CBP), urine analysis, erythrocyte sedimentation rate (ESR), serum electrolytes, blood glucose were done in all the cases. In some of the cases urine culture sensitivity, lumbar puncture for cerebrospinal fluid examination, chest X-ray, ultrasound abdomen, and imaging studies of the brain were done.

Table 1: Age-wise distribution of the cases

Age (in years)	Males	Females	Total	Percent (%)
1 month to 2 years	17	14	31	50%
2-4	13	7	20	32.2%
4-6	8	3	11	17.7%
Total	38	24	62	100%

Most number of the cases were seen in the 1 month to 2 years of age group.

Male predominance was seen and the male to female ratio was 1.5:1.

Table 2: Gender distribution of the cases for type of convulsions

	Males	Females	Total
Typical febrile seizures	26	15	41 (66.1%)
Atypical febrile seizures	12	9	21 (33.8%)
Total	38	24	62 (100%)

Typical febrile seizures were more common than the atypical ones.

Family history: Of the total 62 cases, a positive family history of seizures was present in the parents or older or younger siblings in 6 (9.6%) cases.

Recurrent seizure history: Of the total 62 cases, history of recurrent seizure was present in 11 (17.7%) cases.

Table 3: Underlying cause of fever in the cases

Cause of fever	No. of cases	Percent (%)
URTI	21	33.8%
LRTI	19	30.6%
UTI	9	14.5%
ASOM	6	9.6%
Meningitis	1	1.6%
Abscess	1	1.6%
Not identified	5	8.0%
Total	62	100%

Febrile seizures were most common (33.8%) in the cases admitted for upper respiratory tract infections.

Discussion

Hippocrates noted the relationship between fever and convulsions in children, as early as the 5th century B.C, but it was observed as a separate clinical entity only after 1980 [5].

Febrile convulsions are seizures precipitated by fever other than CNS infection or any CNS related cause and also the patients do not have any history of afebrile seizures. Previous Indian studies have reported prevalence of 10% in the community and of 3% in hospital admissions [6].

The Yelandur survey reported a prevalence of 3.28 to 5.71 per 1000 population [7].

In the present study we had 62 clinically diagnosed patients of febrile seizures in the age group of one month to six years. In the study period, a total of 1265 hospital admissions in the paediatrics ICU were seen. So the prevalence of febrile seizures in our study was 4.9%. Febrile seizures (FS) are the single most common seizure type and occur in 2 to 5% of children younger than age 5 years [1, 8, 9].

Various studies have reported almost similar numbers for the incidence and prevalence of febrile seizures. However, minor geographic variations are encountered such as a higher prevalence is present in Japan and Guam [10].

Bharucha *et al.* [11] studied Indian Parsi community children for febrile seizures by administering predesigned questionnaires at the community level. They observed the prevalence to be 17.7/1,000 population. Their study group however included a wider age range of children till 14 years of age. They noted that the frequency of febrile seizures is almost same in developing and developed countries.

Age distribution for febrile seizures

In our study the age group considered was one month to six years. Various authors have studied it in different age groups of children. In our study most of the cases (50%) were less than two years age. Shinnar *et al.* [8], also observed peak incidence in the second year of life in their study. Udani V [6] in his review on paediatric epilepsy in India has observed that peak age of onset is around one year and almost 90% of the attacks happen within the first three years of age. The author also observed that presentation can be as late as eight years of age.

Koppad *et al.* [2] studied 74 children with febrile seizures and observed the mean age to be 22.7 ±16.4 months and that the highest frequency of febrile seizures was in the 12-24 months age group.

Muzaffar *et al.* [3] in their study have reported febrile convulsions as the most common type of seizures up to 6 years of age having 4.5% cases.

Naik *et al.* [12] in their study of febrile convulsions in 545 children aged 1 month to 6 years observed that febrile convulsions were more common before 3 years of age.

Sivalingm *et al.* [13] also observed febrile seizures to be the most common cause of seizures in febrile children. They also observed it to be common the age group of less than 5 years.

Gender distribution for febrile seizures

In our study, the febrile seizures were more common in males and the male to female ratio was 1.5:1. Similar observations of males being affected more are reported by

various authors who have given the male to female ratios of 1.3:1 [2] 1.2: 1 [3] 2.2: 1 [14].

Type of febrile seizure

In our study, typical febrile seizures were more common and were seen in 66.1% cases. Other studies have also reported the typical seizures to be more common. Naik *et al.* [12] observed typical seizure in 69.5% of their study subjects. Kumar N *et al.* [15] reported simple seizures in 67.6% of their study population. Our findings are in concordance with those of the above authors.

Family history

In our study, of the total 62 cases, a positive family history of seizures was present in the parents or older or younger siblings in 6 (9.6%) cases. Rane *et al.* [4] have reported a positive family history of FS in 34.9% cases. Sivalingam *et al.* [13] have reported positive family history in 66% cases of simple febrile seizures. Koppad *et al.* [2] reported 16 patients (21.6%) of their cases to have a positive family history of febrile seizures, while this percentage in the other studies has been variably given as 25% to 40%.

Risk of recurrence of febrile seizures

In our study, of the total 62 cases, history of recurrent seizure was present in 11 (17.7%) cases. It is thought that age of onset is perhaps the single most important predictor of recurrent febrile seizures. The younger the child at first episode, the greater is the risk of recurrence (50% in <1 year old versus 20% in >3 years old) [16].

Kumar N [15] studied 528 children for febrile seizures and observed recurrence in 174 (32.9%) cases. Recurrence was more in children who were less than 18 months age.

Rane *et al.* [4] in their study observed parental consanguinity and age less than one year for 1st episode of febrile seizure to be significant risk factors for the recurrence of FS. Other factors like duration of fever, grade of fever, family history of FS and epilepsy, male gender and complex febrile seizure did not confer increased risk for recurrence.

Seinfeld noted that the age and type of FS have a bearing on the risk of recurrence. Usually about one-third of children with a first FS will have a recurrence. The proposed risk factors according to them are a positive family history of FS, age less than 18 months, temperature lower than 40.0 °C at first convulsion and less than 1 hour between onset of febrile illness and first convulsion. More the number of risk factors more is the chance of a recurrence [17].

Underlying cause of febrile seizures

In our study of 62 cases, most of the patients (33.8%) had preceding upper respiratory tract infection. Koppad *et al.* [2] reported 13.5% of their cases of FS had URTIs. The lower respiratory tract infections, urinary tract infections, abscess, etc. are the common underlying foci of infections in children that can precipitate febrile seizures. In some cases the underlying source of infection cannot be delineated with certainty. In our study, in 8% cases the underlying cause could not be identified. In the study by Koppad *et al.* [2] in 16.2% cases the source of infection could not be determined. Our findings compare well with the observations of the above authors.

It is important to have an early referral for patients who have a positive family history or history of recurrent febrile seizures so as to provide an early diagnosis and prompt

treatment of the underlying cause.

There is a risk of subsequent epilepsy in children with FS in 2 to 4% cases. Those having focal, prolonged or recurrent FS have a greater risk of subsequent epilepsy to a tune of 57%. However, a single brief simple FS is not associated with any clinical consequences and resolves completely [18].

Conclusion

Febrile seizure is a common self-limiting disorder in young children and often has spontaneous resolution. It may recur in a few cases. Patient admission to rule out other causes of seizures, creating awareness in parents, counselling for regular follow up are important.

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