Recurrence Risk Of Febrile Seizures In Children

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Abstract

Background : Identifying children with febrile seizure who are at risk for recurrence is important so that special attention can be given to them. The objective of this study was to identify the risk factors for recurrence of febrile seizures in children. **Methods :** This prospective hospital based study was conducted among children of 6 months to 6 years of age. Children meeting the selection criteria were enrolled in study. Clinical, investigation, treatment and outcome parameters were analyzed. **Results :** A total of 82 children with febrile seizure were enrolled in the study. Males accounted for 69.5% and females 30.5%. Simple febrile seizure was present in 47.6% and complex febrile seizures were seen in 52.4%. Recurrence of seizure was seen in one-third of cases. Loss of consciousness was the most common post-ictal phenomenon followed by confusion and lethargy. Upper respiratory infection was the most common precipitating factor. Generalized Tonic-Clonic Seizure was the most common seizure type present in 79.2% of cases. Significant risk factors for recurrence occurred in males ($p=0.088$), age less than 1 year ($p=0.003$). Most of the recurrence occurred within one year of the first seizure. **Conclusion :** Febrile Seizure is common in males. Almost one-third of children with febrile seizure are at risk for recurrence. The significant risk factors for recurrences are male gender and age <1 year.

Keywords : Epilepsy; febrile seizure; recurrence

Introduction : Febrile seizure is a seizure which occurs in the presence of a clinically recognizable infection with an exclusion of central nervous system infection.[1] Febrile seizure (FS) is a common childhood problem.[2] It presents as a simple and complex febrile seizure. Simple febrile seizures are generalized seizures, lasting less than 15 minutes, not recurring within 24 hours, and with no post-ictal neurological abnormalities. Complex febrile seizures are focal, prolonged or recurrent within 24 hours or associated with postictal neurological abnormalities including Todd paresis.[3] Febrile seizure can recur, Pavlidou et al in their study found 48% had recurrence of febrile seizure.[4] There are different observations in regard to recurrence. In the study done by Ojha AR et al showed 51% recurrence risk in children with febrile seizure without any relationship with age.[5]

Many researchers have shown that febrile seizure has significant family histories.[6] A positive family history of febrile seizures points to the importance of genetic factors and common environmental exposures.[7] According to Farrell et al, most recurrences occur with in one year of the initial seizure.[8] There are variable observational data on risk factors for recurrences and there are debates putting a child on anti-convulsant prophylaxis having recurrences.

In this context this study can be useful to know about the risk factors involved in recurrence of febrile seizure. This can guide a physician for possible intervention such as putting the child on prophylaxis treatment for seizures. This is important because the attack of febrile seizure is a traumatic experience both for the child and the parents.

Method : This was a descriptive prospective study conducted over a period of one year, in the Department of Paediatrics of tertiary care hospital in Ahmednagar, Maharashtra.

Inclusion Criteria

1) Children from the age of 6 months to 6 years.

2) Diagnosed cases of febrile convulsions.

Exclusion Criteria

1) Patients with afebrile seizures

2) Patients on regular anticonvulsants treatment

3) Patients who refused to give consent

All the children admitted with the diagnosis of febrile seizure, who met the above inclusion and exclusion criteria were taken as the study cohort. The parents of children were interviewed during admission by asking screening questions to verify that the child had not had afebrile seizures. Acomplete description of the seizure from the parent or, from an eyewitness was taken.

Simple febrile seizures were pre-defined as generalized seizures, lasting less than 15 min, not recurring within 24 hours, and with no postictal neurological abnormalities. Similarly, complex febrile seizures were pre-defined as focal, prolonged or recurrent within 24 hours or associated with post-ictal neurological abnormalities including Todd paresis.[3] Those children who had a past history of at least one febrile seizure and presently had come with another episode of febrile seizure were regarded as recurrent febrileseizure.

Prenatal and perinatal history of each child, family history of febrile seizure and epilepsy, age during first febrile convulsion (incasesof $\geqslant$1recurrences), presence or absence of focal features, duration of the febrile seizure, the duration of fever prior to the seizure and whether repeated episodes within the same febrile illness had occurred or not was recorded in a pre-designed Performa. Complete physical, developmental and neurologic assessments were conducted in each child. On arrival temperature was taken and the child was investigated for fever as per the decision of treating physician. All the investigation reports were recorded. The results were analyzed by descriptive statistics and Chi-square test

Results : During our study period a total of 82 children with febrile seizure who fulfilled the selection criteria were enrolled. Males accounted for 69.5% and females 30.5% of the total population enrolled. A simple febrile seizure was present in 47.6% and complex febrile seizure was seen in 52.4%. In the study group, 7 (8.5%) had family history of febrile seizures. There were five patients who had developmental delay. Most common precipitating factor for febrile seizure was upper respiratory infection followed by gastrointestinal infections.

As seen in table 1 and 2 recurrences of seizure was seen in 28% of cases. Loss of consciousness was most common postictal phenomenon followed by confusion and lethargies. Generalized Tonic-Clonic Seizure (GTCS) was the most common seizure present in 79.2% of cases. Mean duration of seizure was 6.9 minutes. A typical and a typical seizure was almost equally present among the children.

Table 1. Baseline characteristics of children with febrile seizure

Characteristics	Number (n=82) (%)
Sex	
Male	57 (69.5)
Female	25 (30.5)
Seizure recurrence	
No	59 (72)
Yes	23 (28)
Developmental history	
Normal	77 (93.90)
Abnormal	5 (6.1)
Family history	
No	75 (91.5)
Yes	7 (8.5)
Treatment history	
No	77 (93.90)
Yes	5 (6.1)
Diagnosis	
Typical	39 (47.6)
Atypical	43 (52.4)

Table 2. Baseline characteristics of children with febrile seizure

Characteristics	Number (n=82)
Postictal Phenomenon	
Lethargy	**9 (10.9)**
Confusion	**12 (14.6)**
Loss of consciousness	**60 (73.1)**
Todd's palsy	**1 (1.4)**
Precipitating factors	
URT infection	**38 (46.3)**
LRT infection	**12 (14.6)**
UTI	**3 (3.7)**
GI infection	**19 (23.2)**
Others	**10 (12.2)**
Type of seizures	
GTCS	**65 (79.2)**
Simple partial	**9 (10.9)**
Complex partial	**8 (9.9)**

Table 3: Association of Different Factors With Recurrence Of Febrile Seizure

Variables	Category	Recurrence	Non recurrence	P-value
Age at first seizure		16.6±15.4	20.3±15.0	0.04
Sex	Male	20	37	0.088
	Female	4	21	
Duration of seizure		6.9±6.4	6.8±4.7	0.8
Type of seizure	GTCS	19	46	0.8
	Simple partial	3	6	
	Complex partial	1	7	
Family history	No	24	51	0.6
	Yes	3	4	
History of prophylaxis	No	18	59	0.001
	Yes	4	1	
Diagnosis	Typical	9	30	0.239
	Atypical	15	28	

As shown in table 3, significant risk factors for recurrence of febrile seizure was male sex=0.088) andage<1year (p=0.003). Most of the recurrence occurred within one year of the first seizure. Duration of fever prior to the onset of seizure, duration of seizure at the onset of first febrile seizure and family history of seizure was not found to be significantly associated risk factors for the recurrence of febrile seizure.

Discussion : In our study children admitted for febrile seizures had a simple febrile seizure and complex febrile seizure in equal proportion. Two studies conducted by Millichap et.al and Mustafic et.al have found a higher frequency of simple febrile seizure.[9,10] Male sex accounted for a higher percentage (69%) among the study children. Another study conducted by Trainor J et.al had shown that 64% of the study population were males which were comparable to our study.[11] There are other studies which had also shown that it is the male children who were predominantly affected.[12,13]

The most common cause of fever in the study population was URTI (46.7%) which most of the time is of viral origin which is followed by GI infection. Another study conducted by Berg et.al has shown that 35% of cases had a fever of viral origin.[6] Similarly the overall viral identification rate in a study was 49%.[7] Likewise 53% of the children had upper respiratory tract infection in a study which is comparable to our study.[8] In our study we used clinical signs and symptoms to diagnose a child with viral fever.

In the present study 26% of children with febrile seizure had a recurrence. A study conducted by Al-Essa et.al had showed there currence rate of 48 % in their study.[14] This is probably because we have not followed up children with the first episode of febrile seizure. In our study we found a significant relation of febrile seizure recurrence with age that age <1 year are more prone to recurrence of febrile seizures. These children had significant risk of recurrence. This compares with other studies[4,6,14,15] done by different authors which have shown that younger age children are prone to the risk of recurrence. This could be because of seizure threshold decrease with decreasing age.[15] Mean duration of seizure was 6.9 minutes which had no significant correlation with recurrence.

A study by Fukuyama et.al and Zhao et.al has mentioned that positive family history of febrile seizure is a risk factor for recurrent febrile seizure.[7,13] In contrast, in our study we found no significant association of febrile seizure recurrence with family history of febrile seizure which is consistent with the result of meta-analytical review.[6] This result might have been influenced by small sample size. In this study there were seven cases having developmental abnormality but there was no significant correlation with febrile seizure recurrence. A study proposed by Knudsen et.al done to find out recurrence risk after first febrile seizure also reported no increased risk of recurrent febrile seizure with slight psycho motor delay[16]

Two studies by Ojha et.al and Pavlidou et.al have shown that children were more likely to have recurrence of febrile seizure if they had a shorter duration of fever before onset of seizure which is not consistent to our study.[4,5]

In our study prophylaxis group had more recurrence of seizure compared to nonprophylaxis group in contrastto the study done by Pavlidou et al to find out indications for intermittent diazepam prophylaxis in febrile seizures which showed recurrence rates higher in the prophylaxis group.[17] It may be because our study prophylaxis group included more cases of developmental abnormalities.

Conclusion: Febrile seizureis one of the common causes of paediatric hospital admissions. Febrile Seizure is common in males and GTCS accounts for the majority of the cases. Almost one-third of children with febrile seizure are at risk for recurrence. The significant risk factors for recurrences are male gender and age <1year. These findings need further validation with further studies involving large sample size with long term follow-up.

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