

Risk Factors For Recurrent Febrile Convulsion

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Summary:

Febrile convulsion is the most common form of convulsions in children. Parents are usually concerned by the risk of recurrence. The aim of this study was to determine the incidence and risk factors for recurrence. All children between four months and six years, admitted to Dhaka Shishu Hospital with febrile convulsion during July 2001 to June 2002, were enrolled in this study. There were 95 cases of which nine were lost in follow-up; therefore results were analyzed for 86 cases. Eighty seven percent patients were between four and 18 months of age and 63.95% below 12 months. Male-female ratio was 2.07: 1. Generalized convulsion occurred in 95.34% cases.

Introduction:

Febrile convulsions occur in young children when there is rapid increase in their body temperature. It is defined as epileptic seizures that are provoked by fever of extra cranial infective origin and occur in children aged between six months and five years^{1,2}. It may, however, occur from four months up to six years of age^{3,4}. Febrile convulsion occur in 25% of all children below five years of age, making it the most common form of seizures in children⁵. It was as high as 9% in Japan and 15% in Mariana Island⁶. If a child has had a febrile convulsion, he or she is prone to more. About four out of ten children who had febrile convulsion will get them again at some stage,

Seizure duration of less than 15 minutes was in 83.72% cases. Family history of febrile convulsions was reported in 20.93% cases. Recurrence within year of follow up occurred in 33.72% of the patients. Factors associated with recurrence were - first episode of convulsion before six months, which was true for 24.13% in recurrence vs. 5.26% in non-recurrence group ($P<0.05$) and clusters of convulsions within 24 hours of first attack, which was 48.27% vs. 26.31% in recurrence and non-recurrence group respectively ($P<0.05$).

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although the risk factors differs greatly from child to child⁷. A child is four times more likely to have a febrile convulsion if either parent was affected in their childhood. Children who have their first febrile convulsion before the age of one year has a 50% chance of further seizures⁸. Parents are psychologically traumatized by seeing their child developing the very first febrile convulsion. They become quite concerned about the likelihood of child death during an attack and means to prevent it. Therefore, they often become obsessed about the risk of recurrence and possibility of development of epilepsy in the future. This study was carried out to know the incidence of the recurrence and its risk factors among the children of this country.

Materials and methods:

All children between four months and six years admitted to Dhaka Shishu Hospital with a history of first or recurrent attack of febrile convulsion during July 2001 to June 2002, were included in a prospective study to determine the recurrence rate and the risk factors for recurrence. A study physician who collected the data examined all patients and was supervised by a consultant paediatrician. The data collected include: age at first onset of convulsion, sex, duration of fever, duration of convulsion, description and recurrence of convulsion within 24 hours and family history of convulsion. In addition to physical examination, developmental history, and pre- and perinatal events were also recorded. Lumber puncture along with other

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routine investigations were performed for first attack of convulsion. All patients were followed up every three months for one year. Nine cases were excluded from the study, as follow up could not be maintained due to lack of proper address.

Enrolled patients were divided into two groups according to history of recurrence and the results were statistically analyzed between recurrence and non-recurrence group by doing Z test and finding of P values.

Results:

A total of 95 patients were included in the study, nine cases were excluded. Out of 86 (95 - 9) cases 10 (11.62%) were below six months of age at onset, 45 (52.32%) between six and 12 months, 20 (23.26%) between 13 and 18 months and 11 (12.79%) were above 18 months (Figure-1). Fifty eight patients were male and 28 female (ratio 2.07: 1). Febrile convulsions were generalized in 82 (95.34%) cases and partial in four (4.65%) cases. In 72 (83.72%) cases the duration of

seizure was less than 15 minutes and in rest (16.28%) it was more than 15 minutes. More than one attack within 24 hours of onset of fever was found in 29 cases (33.72%). Family history of febrile convulsion was reported in 18 (20.93%) cases.

Recurrent febrile convulsions occurred in 29 (33.72%) cases. Male female ratio in both recurrence and non-recurrence group were similar (Table-1). In recurrence group onset of first convulsion occurred at four months of age in five (17.24%) cases, in contrast to one (1.75%) in non-recurrence group ($P < 0.05$). In 21 (72.41%) cases of recurrence group first attack of febrile convulsion occurred before one year of age and it was true for 3-a (59.65%) in non-recurrence group ($P > 0.05$). In 14 (48.28 %) of recurrence group frequent convulsions occurred within 24 hours of first onset but in non-recurrence group it happened in 15 (26.32%) cases ($P < 0.05$).

None of the patient had any neurodevelopmental abnormalities.

Table –I
Risk factors for recurrence in patients with febrile convulsion (n=86)

Risk Factors	Children with recurrence (n=29) No (%)	Children without recurrence (n=57) No (%)	P-value
Age at onset:			
4 months	05 (17.24)	01 (1.75)	$P < 0.05^*$
5 months	02 (6.90)	02 (3.51)	$P > 0.05$
4 months & 5 months	07 (24.14)	03 (5.26)	$p < 0.05^*$
6 months - 12 months	14 (48.28)	31 (54.39)	$P > 0.05$
13 months - 18 months	06 (20.69)	14 (24.56)	$P > 0.05$
19 months - 24 months	00	00	
>24 months	02(6.90)	09 (15.79)	$P > 0.05$
Sex:			
M: F	20: 9(68.97: 31.03)	38: 19 (66.67: 33.33)	$P > 0.05$
Types of convulsion:			
Generalized	27 (93.10)	55 (96.49)	$P > 0.05$
Focal	02 (6.90)	2(3.51)	$P > 0.05$
Clusters of convulsion at first attack	14 (48.28)	15(26.32)	$P < 0.05^*$ Duration of feve
at onset:			
<24 hours	15 (51.72)	30 (52.63)	$P > 0.05$
>24 hours	14 (48.28)	27 (47.37)	$P > 0.05$
Duration of convulsion:			
<15 minutes	25 (86.21)	47 (82.46)	$P > 0.05$
>15 minutes	04(13.79)	10 (17.54)	$P > 0.05$
Family history of convulsion	06(20.69)	12 (21.05)	$P > 0.05$

* Statistically significant

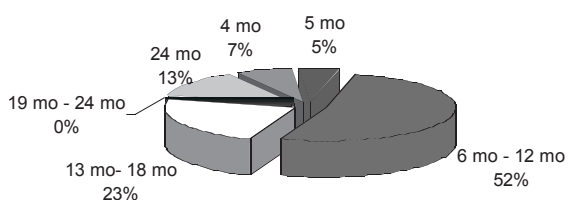


Fig.- 1 : Age wise distribution of patients with febrile convulsion (n=86)

Discussion:

Febrile convulsions have long been recognized, but only in recent years more fully understood. Hippocrates, writing in the fourth century BC, described such a convulsion, clearly differentiating it from rigors and breath holding attacks. He noted that both generalized and partial seizures can occur, and realized that there was a strong association with age, high fever and a precipitating infection⁸. Children between the ages of six months and five years are affected; most are at the younger end of the age range. According to Consensus Development Panel it can occur as early as four months of age³. In this study in 64% cases it occurred before 12 months of age. Febrile convulsions are found age dependent with a similar distribution curve in several studies⁹ including the present study (Figure-I). It was also found that in 10 (11.62%) cases the subjects were less than six months old, and it was reported less than 06% in the literature⁹. In this study the males outnumbered the females and this finding is similar to those of previous studies^{10,11}. For some reasons boys are more likely to be affected than girls.

Simple febrile convulsions occur four times more than complex febrile convulsions¹². The findings of current study conforms to that. In this study generalized convulsion occurred in 82 (95.35%) cases and partial seizure was found in 4.65% cases. Duration of seizure of less than 15 minutes was found in 83.72% patients and in 16.28 % it was more than 15 minutes. Bessisco et al found seizure duration of less than 15 minutes in 92% cases and more than 15 minutes in 8% cases⁹. Long lasting seizure more than 30 minutes were reported with variable incidence from 18 to 35%^{7,13,14,15}. In some studies it was shown that in 70-75% cases the most long lasting seizure was of seven minutes during initial seizures^{16,17}. In

this study 33.72% had more than one convulsion during 24 hours of first attack. It is reported to be 14% and 16% in two other studies^{9,18}. Duration of fever was less than 24 hours in 52.33% cases in this study whereas it was found 75% in another recent study⁹.

This study showed that 21 % of patients had family history of febrile convulsion. Different studies found similar incidence (17-22%) among siblings^{6,9,19}. Aicardi and Chevrie found an incidence of 31% in first degree relatives^{16,20}. The empiric risk for further offspring in a family with one affected child is approximately 10%. Children may inherit the tendency to suffer from febrile convulsion from their parents^{21,22}. If either parent suffered from febrile convulsion in childhood, the risk of the child getting it rises by 10 to 20 percent. If both parents and their child have at some point suffered a febrile convulsion, the risk of another child getting it rises by 20 to 30 percent²³. Febrile seizures are 2-3 times more likely in family members of affected children than in the general population²⁴. Most studies suggest a dominant mode of inheritance with reduced penetration and variable expression^{24,25,26}.

Recurrence of convulsion occurred in 29 patients (33.72%) within a year in this study. Approximately 25 to 37 percent of patient with febrile convulsion will get at least one recurrence^{7,27,29,29}. In this study out of 29 cases of recurrent febrile convulsion, five (17.24%) had first episode of convulsion at four months of age and out of 57 in non-recurrence group only one (1.75%) had the episode at this age (P<0.05). Recurrence for infants of below one year was 38.18% and above one year 25.81%. The risk of recurrence for infant below one year was 50% and above one year 28% in other studies^{8,30,31}. No significant gender difference was found for recurrence, although the boys outnumbered the girls in both recurrence and non-recurrence group. Male to female ratio was 2.2: 1 and 2: 1 in two groups. Patients with more than one attack of convulsion within 24 hours of first onset had recurrence in 48.28% compared to 26.32% in non-recurrence group (P < 0.05). Bessisco et al, in their study, found that patients with cluster onset had recurrence in 44% compared to three percent (P=0.00) in those without recurrence⁹. Other factors like duration of fever,

duration of seizure, family history of convulsion were not found to be significant in this study.

This study showed that one third of the patients with febrile convulsion had recurrence and risk factors for recurrence were onset of first febrile convulsion before six month of age and clusters of convulsion within 24 hours of first onset. Patients should, therefore be, properly counselled about the recurrence of febrile convulsion and their immediate management in all cases with particular emphasis to those who has risk factors for recurrence.

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