

RESEARCH

FEBRILE SEIZURE: RECURRENCE AND RISK FACTORS

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Abstract:

Background:

Febrile Convulsion is the most common convulsive disorder in children, occurring in 2 to 4% of the pediatric population and recurring in 30-50% of cases. Considering the varying recurrence rates reported, this study was conducted at the pediatric ward of the Shaheed Beheshti General Hospital, between 2000-2001 to determine the frequency of recurrence and related risk factors in children presenting with their first episode of febrile convulsion

Materials & Methods:

A two-year cohort study was performed on 50 children presenting with the first attack of febrile convulsion. Patient demographic data including age, sex, type and duration of seizure, family history of febrile seizure or epilepsy and the interval between fever onset and occurrence of seizure were recorded in questionnaires. Those patients, for whom prophylactic medication was not administered, were followed at three-month intervals for up to one year. Findings were statistically analyzed using Fisher's exact test.

Results:

Recurrence was observed in twelve children (24%) out of the fifty, being most common in patients aged less than one year (54.4%). Recurrence rates among children with a positive family history of febrile convulsion, presence of complex febrile seizure and positive family history of epilepsy were 42.1%, 42.8% and 25% respectively. From among those children with a "less than one hour" interval between fever onset and occurrence of seizure, recurrence occurred in 43.7% of cases, while in those with a "more than one hour interval", 14.7% experienced recurrence.

Conclusion:

Recurrence rates are increased by certain factors including age-below one year-, positive family history of febrile convulsion, and a "less than one hour" interval between time of fever onset and seizure occurrence.

Keywords: Febrile Seizure, Recurrence, Risk Factors

Introduction

Febrile seizure, the most common convulsive disorder in children, occurs in 2 to 4% of the pediatric population (1); it is defined as a convulsion associated with a temperature higher than 38.5°C, in children aged between six months to five years, occurring in the absence of any infection of central nervous system or other explanatory causes (1,2). In children presenting with a first episode of febrile convulsion, seizure recurs for the second time in 30 to 50% of cases. Recurrence occurs within six and twelve months following the first episode in 50 and 75% of cases, respectively (1,2). Various factors contribute to recurrence; these include family history of febrile convulsion and epilepsy, age, type of febrile convulsion, the time interval between onset of fever and occurrence of seizure, presence of developmental delay and the degree of fever at the time of seizure (2). In different studies, various recurrence rates have been reported. Considering the scarcity of research in this regard in Iran and also that most recurrences occur within one year after the first attack, this investigation was conducted to determine the frequency of recurrence and its risk factors in the hospitalized children presenting with the first episode of febrile convulsion at Shaheed Beheshti General Hospital in Kashan between 2000-2001.

that did not meet all the necessary criteria were excluded.

Patient demographic data including age, sex, type of febrile seizure, the time interval between fever onset and seizure occurrence and positive family history of febrile convulsion or epilepsy were recorded in specific questionnaires. For detection of recurrence, those cases for which no prophylactic medication had been prescribed were followed once every three months for up to one year by either follow - up visits or telephone contact. Fisher's exact test was used for statistical analysis of the data.

Results:

Recurrence was observed in twelve (24%) of the fifty children; these twelve cases included 7 boys and 5 girls, with two to three-year-old children being most commonly (28%) involved. Recurrence was most frequently observed in children aged below one year (54.5%).

There was a significant difference between the recurrence rates in children less than one year of age as opposed to the older ones (P value = 0.014). Table 1 shows the frequency of recurrence according to age in our patients. Of the nineteen children with positive family histories of febrile convulsion, eight (42.1%) experienced recurrence, whereas of the four children with positive

Table 1: Frequency of seizure recurrence in patients with febrile convulsion, according to age.

Recurrence \ Age (year)	< 1	1 - 5	Total
	No. (%)	No. (%)	No. (%)
Positive	6 (54.55)	6 (15.38)	12 (24)
Negative	5 (45.45)	33 (84.62)	38 (76)
Total	11 (22)	39 (78)	50 (100)

Materials and Methods:

This is a cohort study performed on fifty children presenting with their first attack of febrile convulsion, diagnosed according to the existing criteria (1), by a pediatric neurologist. Children with febrile convulsions

family history of epilepsy, recurrence occurred in only one case (25%).

Among patients with complex febrile convulsion, seven children (42.8%) and of patients with simple partial seizure (20.93%) experienced recurrence, the difference between the 2 groups not being statistically significant (P=0.3).

Recurrence rates were 43.7% and 14.7% in the two groups of “less than one hour” and “more than one hour” intervals between fever onset and seizure occurrence, respectively. The difference in recurrence rates between these two groups was significant (P value = 0.036). Table 2 shows the recurrence rate according to the interval between time of fever onset and that of seizure occurrence.

with the figures cited in other authoritative texts (1,2,4,5). We found no correlation between type of seizure and recurrence rate, whereas other investigators have reported otherwise; Al – Eissa found more recurrences among children with complex type of febrile seizure (8), but Anneger, et al reported that recurrence rate is independent of type of seizure.(11)

Table 2: Frequency of seizure recurrence in patients with febrile convulsion, according to the time interval between fever onset and seizure occurrence.

Time interval (hours)	< 1	1 – 24	Total
	No.	No.	No.
Recurrence	(%)	(%)	(%)
Positive	7 (43.75)	5 (14.7)	12 (24)
Negative	9 (56.25)	29 (85.3)	38 (76)
Total	16 (32)	34 (68)	50 (100)

Discussion

In our study recurrence was observed in 24% of children during a one-year follow up period. Different recurrence rates have been cited in various studies: Ran tala et al in Finland, 21%;(6) Al – Eissa et al in Saudi Arabia, 26% (7) and Martin et al in Spain, 34%.(8) As is obvious, our results are compatible with those. Recurrence rate after the first episode of febrile seizure has been cited to be up to one-third in authoritative texts (1-5). According to present literature, 75% recurrences have been documented as occurring during the first year after the initial attack, similar to the findings of our study.

We found febrile convulsion most commonly among children aged between 2 to 3 years old, while other investigators have reported 14 to 18 month-old infants as the most frequently involved group.

In the studies of Salehian (12) and Sharifi (13), febrile convulsion was also most commonly observed in children 2 to 3 years of age. The different results in our population may be explained by ethnic and genetic differences. As in the studies of Al Eissa (8), Martin (9) and Knudson, (10), we also found most cases of recurrences in children below the age of one year (54.5%), a finding is compatible

In our study no correlation was observed between positive family history of epilepsy and recurrence rate (P=NS), while Al – Eissa’s findings are contrary to ours (8). Most authoritative texts have recognized this as a factor not affecting recurrence rate (1,3,4,5). We found a significant correlation between positive family history of febrile convulsion and recurrence (P value = 0.036). Rantala et al (7) and Martin et al (9) also found the same results, while Al – Eissa et al did not (8).

In circumstances when the interval between time of fever onset and occurrence of seizure was less than one hour, we found more cases of recurrence. (44.7% versus 17.3% in the “less than one hour” versus the “more than one hour” group, respectively). Results of the Breg et al study (4) were also similar to ours.

Conclusion:

Recurrence of seizures after the initial episode of febrile convulsion is more commonly observed in children less than one-year old, those with positive family history of febrile convulsion and with a “less than one hour” interval between time of fever onset and commencement of seizure. A more comprehensive research with a longer period of follow – up is recommended.

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