

FEBRILE CONVULSIONS IN CHILDREN: RELATIONSHIP OF FAMILY HISTORY TO TYPE OF CONVULSIONS AND AGE AT PRESENTATION

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Background: Febrile Convulsions are the commonest cause of convulsions in children under five years of age. Present study was conducted to know relationship of positive family history of convulsions to the type of febrile convulsions and age of presentation. **Methods:** This study was carried out in the Department of Paediatrics, Hayat Shaheed Teaching Hospital Peshawar from June 1999 to June 2000. Data of all children with febrile convulsions were recorded on special proforma. Convulsions were labelled as febrile by excluding infections of central nervous system in developmentally normal children on the basis of history, examination and relevant laboratory investigations. **Results:** In 30% children there was positive family history of febrile convulsions and febrile convulsions occurred at earlier age in these children. Febrile convulsions were complex in 35% of cases and out of these there was positive family history of convulsions in 29% of children. As a whole 44% of children had first febrile convulsions below 12 months of age and 56% above 12 months of age. **Conclusion:** Majority of febrile convulsions occurred in first two years of life. Initial febrile convulsions of simple type are more common in children with positive family history of convulsions, in whom first febrile convulsions tend to occur at earlier age. Further, complex febrile convulsions are more common when age at presentation is less than 12 months.

INTRODUCTION

A febrile convulsion is defined as seizure occurring in a child aged six months to five years precipitated by fever arising from infection outside the nervous system¹. Fever is the single most chief complaint in 40–50% of children². Febrile convulsions occur in 2–4% of children under the age of five years and these are the commonest cause of convulsions under five years of age^{3,4}. Simple febrile convulsions last for less than 15 minutes, are generalized, and do not recur in 24 hour period. Focal, multiple and prolonged febrile convulsions are labelled as complex⁵. Febrile seizures are slightly more common in boys⁶. There is a positive family history of febrile convulsions in up to 30% of cases¹. The median age of occurrence is 18–22 months⁶.

In this study relationship of positive family history of convulsions to the type of febrile convulsions and age at presentation was studied.

MATERIAL AND METHODS

This study was carried out in Paediatrics department of Hayat Shaheed Teaching Hospital Peshawar. The study included 100 children of ages six months to five years, who were sequentially admitted in Paediatrics department with diagnosis of febrile convulsions. Children with meningitis, developmentally abnormal children and children below six months or above five years of age and children with past history of afebrile convulsions were excluded from the study. Information of all the children admitted with febrile convulsions was recorded on a specially prepared proforma. Convulsions were labelled as febrile mainly by process of exclusion of other causes and on the basis of history, clinical examination and relevant laboratory investigations.

Lumbar puncture is a painful and invasive procedure which may cause coning and death⁷. In this study lumbar puncture was not done as a routine investigation and it was performed on clinical suspicion of meningitis⁷. Irritability, bulging fontanel, neck stiffness, positive Kerning's sign, drowsiness, prolonged focal seizure, multiple

seizures, petechial rash were considered signs of meningitis and lumbar puncture was performed ⁸. When lumbar puncture was not performed patients were kept under observation and reviewed within few hours and if child deteriorated lumbar puncture was performed. Types of investigations were decided on the basis of physical examination and history.

RESULTS

Out of 100 children 55 were males and 45 females. Forty-four percent of children had first febrile convulsion below 12 months of age and 56 percent above 12 months of age. Febrile convulsions were complex in 35 percent and simple in 65 percent. Out of 35 percent of complex type, 25 children were <12 months and 10 children >12 months while in case of simple febrile convulsions 19 children were <12 and 46 children were >12 months old ($\chi^2=16.44, p<0.001$) (Table-1).

Table-1: Age of subjects

Type of Convulsions	Age	No. of cases
Simple Febrile Convulsions (65)	<12 months	19
	>12 months	46*
Complex Febrile Convulsions (35)	<12 months	25
	>12 months	10*

* $p<0.001$

In 30 percent of children there was positive family history of febrile convulsions, while no such history was present in 70 percent. Out of 30 children 10 had complex febrile convulsions while 20 had simple febrile convulsions ($\chi^2=0.052, p$ value not significant) (Table-2).

Table-2: Types of Convulsions and Positive Family History

Type of convulsions	Total Case	Positive Family History
Simple Febrile Convulsions	65	20 †
Complex Febrile Convulsions	35	10 †

†= NS

In children with positive family history of convulsions average age at onset of febrile convulsions was 15 months, while in absence of positive family history average age of onset was 21 months (Table-3).

Table-3: Positive Family History of convulsions Vs Average age of onset

Positive Family History	Average age at onset
Present	15 months
Absent	21 months

DISCUSSION

Disorders of cerebral development (e.g. neuronal proliferation, migration, organization, myelination) may make a child vulnerable to fever provoked seizures at younger age because of many of these developmental processes (e.g. organisation, and myelination) in central nervous system continue after birth through infancy and childhood. Developing cortex is more sensitive to provoked seizures ⁹.

Younger age at onset, complex features of febrile seizures and a positive family history of febrile seizures are important predictors of recurrent febrile seizures and also increase the risk of later afebrile seizures ^{10, 11}. Febrile seizures starting in first year of life peak in second year and the incidence declines with increasing age ¹². In present study 44 percent of children had febrile convulsion below 12 months, 77 percent below 24 months and 87 percent below 36 months. These findings correlate with study conducted by Saidulhaque in 1981 ¹³, where 39.5 percent of cases were below 12 months and 60.50 percent of cases were more than 12 months. In a study by Wallace in 1975 ¹⁴, 37 percent of children were below 16 months and 63 percent were above 16 months.

In this study first febrile convulsions occurred at an average age of 20.93 months. Plochl and Laubichler in 1992 ¹² reported first febrile convulsion at an average age of 22.20 months.

If initial febrile convulsion is complex (i.e. focal features, duration more than 15 minutes, repeated within the same illness) it increases the risk of recurrence as well as future afebrile seizures¹⁵⁻¹⁶. Many studies have reported that complex fits constitute about one third of total cases. In the present study, complex fits occurred in 35 percent of cases and simple fits in 65 percent. In a study by al-Eissa *et al* in 1992 ¹⁷, 62 percent cases were simple and 38 percent were of complex nature. However Wallace-SJ in 1975 ¹⁴ has reported complex febrile convulsion in 61.83 percent of cases. The risk of complex febrile convulsion increases if first fit occurs at a younger age. In this study 25 of the 35 children with complex febrile convulsion were below 12 months of age. Al-Eissa *et al* in 1992 ¹⁷ and Farwell *et al* in 1994 ¹⁸ have also reported that age less than 12 months was related with increased incidence of complex febrile convulsions.

A positive family history of febrile seizures points to the importance of genetic factors and common environmental exposures. In this study 30 percent of the children had positive family history of febrile convulsions. Saidulhaque in 1981 ¹³ has reported 20 percent of children with positive family history in his study. Farwel in 1994 ¹⁸ reported positive family history in 29 percent of the cases.

A positive family history is associated with earlier age of onset. In this study average age of onset was 20.93 months as a whole, while in children with positive family history of febrile seizure average age at onset was 14.5 months. These findings correlate with results of the study carried out by Plochl and Laubichler in 1992 ¹², who reported an average age at onset of 22.20 months and in case of positive family history of febrile seizures 14.3 months.

In present study most of children with positive family history of febrile convulsions had initial febrile convulsions of simple type. In a study conducted by Wallace in 1975 ¹⁴ positive family history was also associated with decreased risk of complex febrile convulsions.

The most common cause of fever leading to febrile convulsions was upper respiratory tract infections (72 percent). Rantala *et al* in 1995 ¹⁹ has also reported in their study that upper respiratory tract infection was the most common cause of fever (67 percent) in febrile convulsions.

CONCLUSIONS

Majority of febrile convulsions presented in first 2 years of life, after that the incidence decreased. Complex febrile convulsions tended to occur at an earlier age. Complex febrile convulsions occurred in one third of cases. In the presence of a positive family history of febrile convulsions, initial febrile convulsions are more likely to occur at an earlier age. A positive family history of febrile convulsions is associated with decreased risk of complex febrile convulsions.

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