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Febrile Seizures: Overview of Knowledge

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Abstract

Febrile seizures are the most common convulsive disorder in children under 5 years old. Among these children, some develop recurrent febrile seizures. The syndrome of febrile seizures is defined as seizures associated with fever in the absence of central nervous system infection or acute electrolyte imbalance in a young child. Febrile seizures occur in approximately 2% to 4% of young children in the United States, South America, and Western Europe. The high frequency reported in Japan 9% to 10% of children.
It is the most benign type of all seizures occurring in childhood. Causation is thought to be multifactorial, combination of genetic and environmental factors. Generally accepted risk factors include Viral infections commonly cause of febrile convulsions, age of onset before 18 months, temperature close to 38°C, shorter duration of fever (less than 1 hour) before the seizure and family history of febrile seizures . The most consistent risk factors reported are a family history in recurrence of febrile seizures.

Introduction

Febrile seizure (FS) is a convulsive event, exclusively occurring in childhood. The International League Against Epilepsy (ILAE) defined FS as a seizure in association with a febrile illness in the absence of a central nervous system (CNS) infection or acute electrolyte imbalance in children older than 1 month of age without prior afebrile seizures. Febrile seizure (FS) the most common type of seizure. The condition is more common in children belonging to a lower socioeconomic status, and occur in 2 to 4 percent of all children. Approximately one third of children who have a febrile seizure have a recurrence. [(1)] The temperature associated with the febrile illness must be greater than 38.4^{C}.although the temperature may not be evident until after the seizure. Febrile seizures have a peak incidence at about 18 months of age, are most common between 6 months and 5 years of age, and onset above age 7 is rare. The child may be neurologically normal or abnormal. Febrile seizures result from a combination of genetic and environmental factors. Of children with febrile seizures, 24% have a family history of febrile seizures. FS occurs more frequently in the Asian population, affecting 3.4%-9.3% of Japanese children.[(2)] Some cases of febrile seizures in large families have been linked to genes on chromosomes 8 and 19 mutations in the α-subunit of the sodium channel (SCN1A and B), and in the γ2-subunit of the γ-aminobutyric acid type A (GABAA) receptor (GABRG2), an important inhibitory neurotransmitter.[(3)] Viral infection is the cause of fever in approximately 80% of cases of febrile seizures. Human

herpes simplex virus 6 (HHSV-6) as the etiologic agent in roseola in about 20% of a group of patients presenting with their first febrile seizures. A one study suggests a relationship between recurrent febrile seizures and influenza A, and human coronavirus HKU1 pose the highest risk for febrile seizures.[4]The earlier the age at which the first febrile convulsion occurs, the more likely are recurrences. Seizure accompanied by fever (before, during or after) without any Central nervous system infection,Metabolic disturbance ,History of previous seizure disorder.[5] A febrile seizure is a convulsive episode occurring in association with an acute febrile illness. This is actually a subcategory of acute symptomatic seizure, differing only in that all children are exposed to the risk factors. Febrile seizures occur in young children at a time in their development when the seizure threshold is low. Febrile seizures can be classified as either simple or complex. A simple febrile seizure is isolated brief and generalized without recurrence within 24 hours. Conversely, a complex febrile seizure is focal, multiple (more than one seizure during the febrile illness), or prolonged duration, lasting either more than 15 minutes. Recurrent febrile seizure within 24 hours. [3]

Aim of the study

Febrile seizures (FSs) are the most common neurological disorder observed in the pediatric age group. The present study provides information about etiopathogenesis, risk factors for first and recurrent febrile seizure.

Materials and Methods

In this prospective study, they identified 347 children (1 month to 10 years of age) who presented with a first febrile seizure at one of four pediatric emergency departments. Information about these children was collected from medical records and interviews with the parents, and the children were followed for a median of 20 months to ascertain whether febrile seizures recurred. [5]

Result

Recurrent febrile seizures occurred in 94 of the 347 children 27 % with a cumulative risk of 25 % at one year and 30 percent at two years. The duration of fever before the initial seizure was associated with the risk of recurrence at one year: for fever lasting less than 1 hour, the risk of recurrence was 44 %; for fever lasting 1 to 24 hours, 23 % and for fever lasting more than 24 hours, 13 %. Among the 340 children for whom information on family history was available, 81 (24 %) each had a first-degree relative who had had febrile seizures. An age of

less than 18 months and a family history of febrile seizures were also associated with an increased risk of recurrence. A family history of epilepsy, complex febrile seizures, and neurodevelopmental abnormalities did not increase the risk of recurrent febrile seizures. [5]

Discussion

The cause of febrile seizures is multifactorial, combination of genetic and environmental factors. Family and twin studies suggest that genetic factors play an important role. There appears to be a multifactorial mode of inheritance for febrile convulsions, but there may be a subset of children with an autosomal-dominant mode of inheritance and also show an occurrence rate ranging from 25% to 40 % of in children with a positive family history of febrile convulsions. [4] Family history also has a role in determining whether children have FS recurrences. All studies that have focused on a history of febrile seizures in a first-degree relative, including this one, have found such a history to be associated with an increase in the risk of recurrence. The results of studies that examined the effect of a family history of epilepsy are conflicting. A large study in Rochester, Minnesota, found virtually no difference in the risk of recurrence among children with a family history of epilepsy (25%) and those without such a history (23%).Our study results tend to agree with those of the Rochester study, although ours are less conclusive.[6,7] In addition Temperature has been correlated with the risk of recurrence in two smaller studies, they found the duration of recognized fever before the seizure was another strong predictor of recurrence. especially among children whose seizures occurred less than one hour after the recognition of fever. Among these children the risk of recurrence at 12 months according to temperature was 71 %for children with temperatures of 101°F, 48 %for 102°F, 44 percent for 103°F, 26 % for 104°F, and 0 % for 105°F or more. Most previous studies of febrile seizures have reported an association between young age at onset and an increased risk of recurrence. [6] This relation appears to be due to the longer period during which a younger child is at risk, rather than a greater tendency to have seizures. Finally, children with neurodevelopmental abnormalities were not at increased risk for recurrent febrile seizures, although several had unprovoked seizures. Other studies have already demonstrated that this is a group at high risk for epilepsy. However, no evidence that treating the first febrile seizure reduces that risk. [7]

Conclusion

Febrile seizures are the most common convulsive disorder in infants and children. Viral infections commonly cause the fever that is associated with febrile convulsions. Our study

found family history of febrile seizures and younger age at initial febrile seizures to be significant risk factors for recurrent febrile seizures. However, we did not find seizure at low temperature or short period between fever and seizure to be risk factors for recurrence of febrile seizures. Knowing these risk factors of recurrent febrile seizures could help physician to identify those children who are at high risk for recurrence and to educate the parents regarding future care.

References

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