

To Study the Incidence, Etiology, Laboratory Profile and Risk Factors of Febrile Seizures

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Abstract

Background: Febrile convulsion (FC) is the most common type of seizure that occurs in children aged 6-60 months. It occurs in two forms including simple and complex febrile seizure. *Objectives:* The purpose of this study was to determine the clinical, epidemiologic and laboratory features of patients admitted to our hospital with febrile seizure in 2014-2015. *Methods:* In this cross-sectional study, the patients with diagnosis of febrile seizure were the target population. We obtained patient's data based on clinical examination, history and information registered in hospital medical files including demographic, clinical and laboratory findings. *Results:* During the study period, 60 children with febrile seizures and mean age of 26.2 ± 19.5 months were studied. Male to female ratio was 1.2:1. 37 (61.9%) children had simple seizures and 23 (38.1%) children had complex seizures. 12 (19.4%) of the patients had family history of febrile seizures and family history of epilepsy was positive in 6.3% of cases. Ninety one percent of cases were born with normal vaginal delivery. Also, only 2 patients (3.1%) had less than 37 weeks of gestational age at birth. The mean rectal temperature of the patients was 38.5 ± 0.67 °C. Gastroenteritis was the most common cause of fever in our patients. *Conclusion:* The highest frequency of Febrile Convulsion was seen in younger than 20-month-old children. Except for the lower incidence of positive history of prematurity and higher prevalence of gastroenteritis, results of the present study are relatively similar to other studies..

Keywords: Seizures; Febrile; Children.

Introduction

Febrile convulsion is one of the most common types of seizures in childhood from which 2-5 percent of children suffer and usually occurs between 3 months and 5 years old. According to the definition of International Epilepsy Association, febrile convulsion occurs in infants older than 1 month together with febrile illness, without any evidence of the central nervous system infection, without history of neonatal seizures or a previous unprovoked convulsion and does not meet the features of other symptomatic convulsions. It is divided into two types: simple and complex. Simple convulsion usually takes less than 10-15 minutes, generalized tonic-colonic,

tonic, colonic or atonic. Complex Febrile Convulsion has one or more of the following features: a focal onset or showing focal deficit during convulsion attack, a duration longer than 15 minutes, during the first 24 hours, it occurs more than once. Despite its benign nature, the febrile convulsion is one of the most common reasons for admission to pediatric emergency wards worldwide. In these patients, in most cases, fever is the result of upper respiratory system, gastroenteritis and urinary tract infection [1-3]. The incidence of Febrile Convulsion varies in different places of the world, ranging from 5-10 % in India, 8.8% in Japan and 14% in Guam [3]. This illness was distinguished from other types of convulsions in the mid-nineteenth century [4]. Recurrence is very common in this illness, but neural evolution does not

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change in patients. Numerous conducted studies have noted hazardous factors for its recurrence for infants less than 15 months old, including fever background, convulsion history in first degree relatives, complex convulsion and looking after in daily care units [5]. The study by Kong revealed that the convulsion history in first degree relatives was the only substantial risk of convulsion recurrence [6].

Objectives

With respect to the issue that Febrile Convulsion is the most common seizure type in children, the objective of this study was to assess the clinical, epidemiological and laboratory characteristics of Febrile Convulsion in children and its comparison with similar studies in other parts of the world.

Methods

In this cross sectional study, 60 children aged between 6-72 months presenting with Febrile Convulsion who were admitted to the pediatric emergency ward of our hospital between June 2014 and June 2015 were evaluated. Data were collected regarding age, gender, type of convulsion (generalized or focal), duration of convulsion, type of the febrile convulsion (simple or complex), rectal temperature, family history of convulsion, familial background of epilepsy, past history of the febrile convulsion, underlying causes of fever, existence or nonexistence of meningitis signs and symptoms, gestational age at birth, clinical and laboratory data. Patients with a past history of unprovoked convulsion, metabolic disorders, known illnesses of central nervous system and neurological deficits were excluded from this study. Abnormal cerebrospinal fluid analysis included one or more of the following features: positive gram stain, more than 5 white blood cells, and low glucose content of cerebrospinal fluid or increased CSF protein. Anemia is defined as hemoglobin levels less than 11 g/dl for age group 6-72 months. A written informed parental consent was obtained for each patient in this study.

Results

The mean age of patients was 26.2 ± 19.5 months. 33 (54.4%) were boys and 27 patients (45.6%) were girls. The highest frequency of Febrile Convulsion was seen in the six to 20-month age group, which included 32 children (53.9%). In contrast, the lowest frequency

belonged to the age group of 34-48 months, which contained only 4 children (6.3 %). There was a history of prematurity in 2 children (3.1%). A family history of Febrile Convulsion and epilepsy was found in 12 cases (19.4 %) and 4 cases (6.3 %), respectively. 54 (90%) children were presented with generalized convulsions and 6 (10%) had focal convulsion. Type of Febrile Convulsion was simple in 37 (61.9%) and complex in 23 cases (38.1%). The majority of patients (78%) had seizure durations less than or equal to 15 minutes. The mean rectal temperature during convulsion attack was 38.3°C ranging from 38 to 40°C . According to history and physical examination, it was determined that for 26 patients (43.7%) indications for lumbar puncture were put. Lumbar puncture was performed for 20 patients and for 6 patients; it was not approved by their parents. Among them who were put under lumbar puncture, 3 patients had abnormal findings in cerebrospinal fluid analysis in favor of meningitis. For each patient, an average of 4.6 laboratory diagnostic tests was performed. Cerebral imaging was conducted on 11 patients (18.7 %), however, these tests did not show any abnormality in any of the cases. Among all the patients, convulsion of 20 individuals (37.5%) was controlled with therapeutic measures. Proportion of patients with febrile seizures to all hospitalized patients for seizure disorders was 30%. 23 (38.7%) patients were visited by a physician for current illnesses before seizure attack. 35 (58.5%) had a background of antibiotic consumption during the current illness. (Table 1) shows the abnormal laboratory findings in patients with Febrile Convulsion. Gastroenteritis was the most common cause of febrile illness in our study (Table 2).

Table 1: Frequency of Abnormal Laboratory Findings in Patients with Febrile Convulsion

Lab Abnormality	Cases, n = 60, No. (%)
Leukocytosis	14 (23.8)
Leukopenia	2 (3.7)
Thrombocytosis	7 (12.5)
Thrombocytopenia	4 (6.9)
Anemia	21 (35)
Hypoglycemia	5 (8.1)
Hypernatremia	3 (5)
Hyponatremia	6 (10)

Table 2: Distribution Frequency of Etiology of Fever in Patient with Febrile Convulsion

Etiology of Fever	Cases, n = 60, No. (%)
Urinary Tract Infection	10 (16.2)
Gastroenteritis	22 (38.1)
Meningitis	3 (5)
Respiratory Tract Infection	12 (20)
Otitis Media	1 (1.2)
Unclassified	12 (19.5)
Total	60 (100)

Discussion

Febrile convulsion is the most common type of seizure during childhood which occurs in 2-5% of children. It usually occurs in children between 3 months and 5 years. Fortunately, most febrile seizures are benign and rarely cause brain damage. Although febrile seizures are benign in nature, when seizures occur, they may lead to fear and anxiety of parents and subsequently it potentially affects the family's quality of life. Physical, psychological and behavioral disorders may manifest due to the lack of sufficient information of parents about febrile seizures. In our study, the majority of children were under 2 years old and our findings were similar to other studies in which Febrile Convulsion was in the age range of 6 months to 3 years with peak incidence at the age of 18 months [9]. In the present study, prevalence of Febrile Convulsion was slightly predominant in males than females and this is in agreement with the results of other studies [7,8]. In our study, 12 patients (19.4%) had a positive family history of Febrile Convulsion, while this percentage in the other studies varied from 25% to 40% [10]. 4 (6.3%) in this study had a positive family history of epilepsy, while this frequency varied from 1.6% to 9% in other studies [11]. Ninety percent of children in the present study had generalized convulsion that is similar to the other studies. In our study, 37 children (61.9%) were suffering from simple Febrile Convulsion, while this was between 60 to 90 percent for other studies.

Conclusion

The highest frequency of Febrile Convulsion was seen in younger than 20-month-old children. Except for the lower incidence of positive history of prematurity and higher prevalence of gastroenteritis,

results of the present study are relatively similar to other studies.

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