

INCIDENCE, RISK FACTORS AND OUTCOME OF FEBRILE SEIZURE AT NEPAL MEDICAL COLLEGE AND TEACHING HOSPITAL

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ABSTRACT

Febrile convulsion is the most common seizure in children younger than 5 years of age. Most febrile convulsions are brief, do not require any specific treatment or workup, and have benign prognosis. The aim of this study is to evaluate the clinical profile, risk factors, investigations, treatments and outcome of hospitalized children with febrile seizure. It is an observational cross-sectional study, conducted in children above one month of age to six 6 years of age with the diagnosis of febrile seizure admitted at Nepal medical college and teaching hospital (NMCTH), from 1st July 2012 to 31st June 2014. Age, sex, family history of disease, seizure types, and body temperature during admission and infectious causes of the fever, laboratory investigations were recorded. The children's age ranged between (1-72) months with mean age of 14.9 months in which 61.4% were males. Sixty percent children had typical febrile seizures. Positive family history of febrile seizure was found in 25.7% of children, out of which, 94.4% children were first degree relatives. The source of the febrile illness was evident in 64.2%. Recurrent febrile seizure was found in 31.4% children among which 63.6% were between six to twenty-four months of age. Pediatricians should be selective in admitting and investigating children with febrile seizure. The children frequently had typical febrile seizures for which investigations remains low and does not justify extensive work-up or prolonged hospitalization. Positive family history is important risk factor for febrile convulsion.

KEYWORDS

Febrile convulsion, leukocytosis, risk factors

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INTRODUCTION

Febrile seizure is the most common form of seizure in pediatric. Two to five percent of children experience febrile seizure, among which 65.0-90.0% are simple febrile seizure seen more commonly in males.¹ According to the definition of International Epilepsy Association, febrile convulsion occurs in infants older than one 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. Despite its benign nature, the febrile convulsion is one of the most common reasons for admission to pediatric emergency wards worldwide and when seizures occur, they may lead to fear and anxiety of parents and subsequently it potentially affects the family's quality of life.² Febrile seizures are age dependent and are rare before 6 months and after 5 yr of age. Febrile seizures are categorized into two types: simple and complex. A simple febrile convulsion is usually associated with a core temperature that increases rapidly to $\geq 39^{\circ}\text{C}$. It is initially generalized and tonic-clonic in nature, lasts a few seconds and rarely up to 15 minutes, is followed by a brief postictal period of drowsiness, and occurs only once in 24 hrs. A febrile seizure is described as complex or complicated when the duration is >15 minutes, when repeated convulsions occur within 24 hrs, or when focal seizure activity or focal findings are present during the postictal period.³ In these patients, in most cases, fever is the result of acute respiratory tract infection (ARTI), acute gastroenteritis (AGE) and urinary tract infection (UTI). The key feature of the febrile seizure is that the fever itself is presumed to be the underlying cause for the convulsion rather than any direct affect of the fever inducing infection on the central nervous system (CNS).⁴ Although the main cause for this type of seizure is not yet recognized, the most important identified risk factor for febrile seizure is the presence of a positive family history in immediate family members.⁵ The occurrence of a child's first (initial) febrile seizures has been associated with: first or second-degree relative with history of febrile and afebrile seizures.⁶

MATERIALS AND METHODS

An observational cross-sectional study was conducted at Nepal Medical College and Teaching Hospital, Attarkhel, Kathmandu, Nepal. Nepal Medical College (NMC) is situated at Attarkhel of Jorpati Village Development Committee, in Kathmandu, about 11 km. northeast of Kathmandu city. All patients with diagnosis of febrile seizure admitted in pediatric ward of NMCTH during July 2012 to June 2014 were included in the study. A febrile seizure was defined as a seizure accompanied by fever without central nervous system infection, occurring in infants and children above one month to 6 years of age. A standard structured data collection form was designed. Patients data including age, sex, family history of disease, seizure types (simple

or complex) and complex seizure subtypes such as focal, repetitive or a duration of more than 15 minutes, body temperature during admission, and infectious causes of fever were recorded in specific self-formatted questionnaires. The following risk factors were studied: age, sex, family history of febrile convulsion in first and second degree relative, family history of epilepsy, onset of febrile convulsion related to onset of fever. All children with a seizure due to central nervous system infections, past medical history of seizure disorder and co morbidity with chronic diseases were excluded from our study. We obtained written informed consent from all parents for inclusion in the study. The Ethical Committee of NMCTH approved the study.

RESULTS

Among 70 children with febrile seizure 43 (61.4%) were male. (Fig. 1) In this study, 58.5% children were in the age group of 6- 24 months. (Fig. 2) The mean age of presentation was 14.9 months.

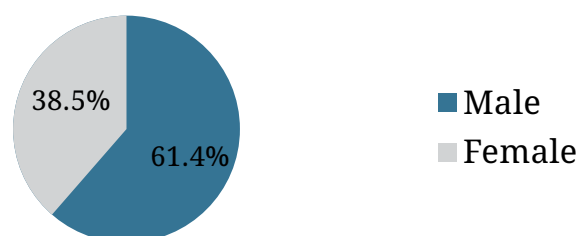


Fig. 1:
Distribution according to gender

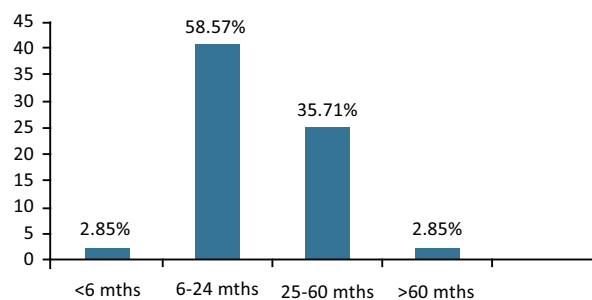


Fig. 2:
Distribution of age

Ninety-five percent children had fever prior to onset of seizure whereas 5.0% had documented fever after seizure has occurred. Forty-two (60.0%) children had typical febrile seizure whereas 28 (40.0%) had atypical seizure. (Fig. 3)

Eighteen (64.2%) children with atypical seizure were due to recurrence of seizure within 24 hours. Family history of febrile seizures was found in 18 (25.7%) children among which 72.2% children were between six to twenty-four months of age. Among positive family history of febrile seizure, seventeen (94.4%) children were first degree relatives and one (5.5%) was second degree relative. (Fig. 4)

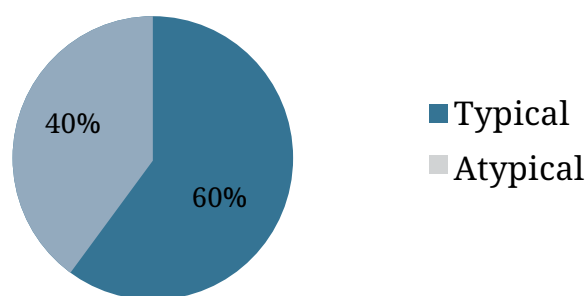


Fig. 3:
Types of febrile convulsion

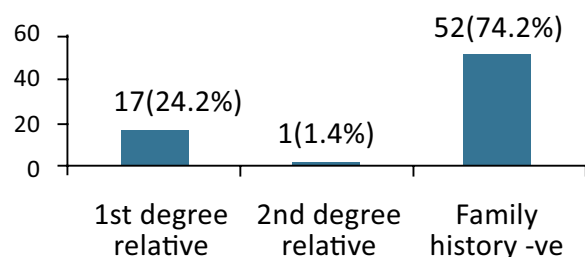


Fig. 4:
Family history of febrile convulsion

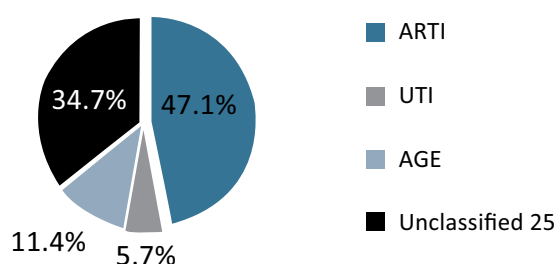


Fig. 5:
Causes of fever

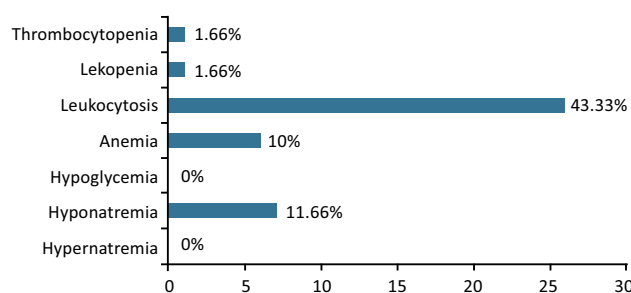


Fig. 6:
Laboratory abnormalities

Total number of recurrent febrile seizure were found in twenty two (31.4%) children, out of which fourteen (63.6%) were between six to twenty-four months of age and 36.3% were between twenty-five to sixty months of age. Thirty-three (47.1%) children had acute respiratory tract infections, 8 (11.4%) had acute gastroenteritis, 4 (5.71%) had UTI as cause of fever where as in 35.7% no cause were identified for fever. In 96.6% children neurological findings were normal. All children with febrile convulsion survived.

Investigations include Complete blood count (CBC) and serum electrolytes were performed in all children. CBC showed leukocytosis suggestive of infection in 26 (43.3%) children. Electrolytes abnormalities were uncommon. Seven (11.6%) children had hyponatremia. (Fig. 6)

DISCUSSION

Almost all the children had fever before onset of seizure except in 5.0% children in whom fever was documented after the parents noticed seizure. In our study, 60.0% of children had typical febrile seizure where as Esegbe *et al* had showed 82.4%.⁷ As 40.0% of our children had atypical febrile convulsion similarly Deng *et al* found 33.0% children had atypical febrile seizure.⁸ Ojha *et al* data showed 20.0% of their children had atypical febrile seizure in Nepalese children.⁹ It shows that typical febrile seizure is more common in children. Here, 61.1% of our children with febrile seizure were males which is slightly higher around 57.0% data shows by Trainor *et al*.¹⁰ Most of the febrile seizure in our study occurred in age group of 6 -24 months which is similar to a study done by Ali *et al*.¹¹ It shows that younger children had increase risk of febrile convulsion. Our analysis revealed 25.7% children had positive family history of febrile convulsion, out of which 94.4% children were first degree relatives and 5.5% were second degree relative. A positive familial history of febrile seizure was 57.0% found by Tosun *et al*.¹² A study done by Alwan *et al* shows 58.6% were first degree relatives.¹³ Hence, our study support that children had high risk of febrile convulsion with positive family history and more likely to occur in first degree relatives. Recurrent febrile seizure were found in 31.4% children which is similar to study done by Tarkka *et al*.¹⁴ Our study showed, among recurrent febrile convulsion group 63.6% were between (6 – 24) months as compare to 30.0% by Berg *et al*.¹⁵ We found 47.1% of children had acute respiratory tract infection (ARTI) , 11.4% had AGE and 5.7 % had UTI as a cause of febrile seizure whereas Pancharoen *et al* found ARTI in 56.1%, AGE in 13.4%, and UTI in 6.1% children .¹⁶ The mean temperature of occurrence of seizure was 101.4° F. Complete blood count and serum electrolytes were performed in all children. We confirmed 43.3% of admitted children had leukocytosis. All children who had atypical febrile seizure were suggested to do an EEG and asked to follow up in the OPD. Overall, 87.5% of the children had normal EEG. Earlier Limbu N *et al* reported normal EEG finding in 71.27% of children with febrile seizure.¹⁷

We conclude that there is an increased risk of febrile seizure in younger age children and those with positive family history and decreased risk as age increases. Paediatricians should be selective in admitting the children with febrile seizures in the hospital. Because the yield of investigations remains low and does not justify extensive work-up or prolonged hospitalization.

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