

ASSESSMENT OF LABORATORY INVESTIGATIONS IN SIMPLE FEBRILE SEIZURES IN A TERTIARY CENTRE

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ABSTRACT

Febrile seizures are one of the most common types of seizures in childhood from which 2-5 percent of children suffer; usually occurs between 3 months and 5 years old and generally have excellent prognosis.

OBJECTIVES

The purpose of this study was to determine the clinical, epidemiologic and laboratory features of patients admitted to Paediatric ward of Krishna Institute of Medical Sciences from 1st January 2014 to 31st December 2015.

PATIENTS AND METHODS

In this prospective cross-sectional study, the patients with diagnosis of febrile seizures were evaluated. We obtained patient's data based on clinical examination, history from hospital medical files including demographic, clinical and laboratory findings.

RESULTS

During the study period, 74 children with febrile seizures were studied. The mean age of patients in our study was 22.7±16.4 months. Forty two patients (56.75%) were boys and 32 patients (43.24%) were girls. The highest frequency of febrile seizures was seen in the 12-24 months' age group, which included 40 children (54%). In contrast, the lowest frequency belonged to the age group of 36-48 months, which contained only 5 children (6.75%). The majority of our patients (62.5%) had seizure durations less than or equal to 15 minutes. The mean rectal temperature at time of admission was 38.6°C.

CONCLUSIONS

Febrile seizure is a common benign disorder of childhood and often resolves spontaneously without any sequel. Therefore, parental education, counselling and reassurance are the cornerstone of management and follow-up.

KEYWORDS

Seizures, Febrile, Clinical, Epidemiological, Laboratory.

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INTRODUCTION

Febrile seizures are one of the most common types of seizures in childhood from which 2-5 percent of children suffer; usually occurs between 3 months and 5 years old and generally have excellent prognosis.¹ It is divided into two types: simple and complex. Simple convulsion usually takes less than 10-15 minutes, generalized tonic clonic, tonic, clonic or atonic. Complex FC has one or more of the following features: a focal onset or showing focal deficit during convulsion attack, 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 Paediatric ICU worldwide. In these patients in most cases, fever is the result of upper respiratory system, gastroenteritis and urinary tract infection.² According to the definition of International Epilepsy Association, febrile seizures occur in

infants older than 1 month of age associated 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.³ The incidence of febrile seizures is 5-10% in India. The average recurrence rate after a first febrile seizure is 30-40%, but this is dependent on complex interplay between the genetic and environmental factors. Recurrence risk is related to various risk factors, which may include the type of treatment. One study found a total of five risk factors for recurrent febrile seizures when no prophylaxis was given.⁴ 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 history of seizures among first degree relatives was the only substantial risk factor for seizure recurrence.⁶

MATERIALS AND METHODS

The objective of this study was to assess the clinical, epidemiological and laboratory findings of febrile seizures in children.

In this cross-sectional study, all children aged between 5 months to 5 years presenting with febrile seizures who were admitted to the Paediatric ICU of KIMS Hospital between Jan

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2014 and Dec 2015 were evaluated. The data related to febrile seizures was collected such as age, gender, type of the febrile convulsion (Simple or complex), duration of seizure, rectal temperature, family history of seizures and epilepsy, past history of the febrile seizures, aetiology of fever, signs and symptoms of meningitis, gestational age at birth, clinical and laboratory reports. Patients with a past history of unprovoked convulsion, metabolic disorders, known illnesses of central nervous system and neurological deficits were excluded from this study. Anaemia is defined as haemoglobin levels less than 11 g/dL for age group 6-72 months. 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. A written and informed consent of parent was obtained for participation in this study. Data was analysed using SPSS software. This study was approved by the Ethical Committee of Krishna Institute of Medical Sciences.

RESULTS

Total number of children admitted to Paediatric ICU of Krishna Institute of Medical Sciences from 1st January 2014 to 31st December 2015 was 972; out of it 74 children had episodes of febrile seizures. The mean age of patients in our study was 22.7±16.4 months. Forty two patients (56.75%) were boys and 32 patients (43.24%) were girls. The highest frequency of febrile seizures was seen in the 12-24 months' age group, which included 40 children (54%). In contrast, the lowest frequency belonged to the age group of 36-48 months, which contained only 5 children (6.75%). A history of prematurity and family history of febrile seizures and epilepsy was found in 4 cases (5.4%), 16 cases (21.6%) and 6 cases (8.10%), respectively. In our study 64 (86.4%) patients presented with generalized seizures and 10 (13.5%) had focal seizures. The febrile seizures were simple in 45 (60.8%) and complex in 29 (39.2%) cases. The majority of our patients (62.5%) had seizure durations less than or equal to 15 minutes. The mean rectal temperature at time of admission was 38.6°C. A detail history was taken and thorough physical examination was done for all patients. It was determined that for 21 patients (28.37%), CSF study should be done. Among patients who underwent lumbar puncture, 2 patients had abnormal findings in CSF analysis in favour of meningitis. Brain imaging study was done on 12 patients (16.2%); however, these tests did not show any abnormality in any of the cases. Acute gastroenteritis (22.9%) was the most common cause of febrile illness, while we could not find out source of infection in 16.2% cases in our study. Hyponatremia and hyperkalemia were most common electrolyte disturbance.

Lab Parameters	Result
Anaemia	(53) 71.6%
Leucocytosis	(18) 24.3%
Leukopenia	(2) 2.7%
Thrombocytosis	(3) 4.0%
Thrombocytopenia	(3) 4.0%
Hypernatremia	(4) 5.4%
Hyponatremia	(6) 8.1%
Hypoglycaemia	(3) 4.0%
Hyperkalemia	(6) 8.1%

Table 1: Frequency of Abnormal Laboratory Parameters

Focus of Infection	Results
UTI	(9) 12.2%
URTI	(10) 13.5%
LRTI	(13) 17.5%
AGE	(17) 22.9%
ASOM	(8) 10.8%
MENINGITIS	(2) 2.7%
ABSCESS	(3) 4.0%
NO SOURCE	(12) 16.2%

Table 2: Distribution Frequency of Aetiology of Fever

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.⁷ Population based studies have shown that the risk of epilepsy after febrile convulsion varies from 2-2.5%. A history of febrile convulsions is present in 10 to 15% of people with epilepsy or unprovoked seizure.⁸ several times higher than the 2 to 4% seen in the general population. Although febrile seizures are benign in nature, they lead to fear and anxiety among parents and subsequently it affects the family's quality of life. Physical, psychological and behavioural disorders may manifest due to the lack of sufficient knowledge of parents about febrile seizures. In the present study, prevalence of febrile seizure was higher among males than females and this is in agreement with the results of other studies.⁷ The highest frequency of febrile seizures was seen in the 12-24 months' age group, which included 40 children (54%). In contrast, the lowest frequency belonged to the age group of 36-48 months, which contained only 5 children (6.75%). Our results are comparable to study done by Ghasem Miri Aliabad et al.⁹ In our study, 16 patients (21.6%) had a positive family history of febrile seizures, while this percentage in the other studies varied from 25% to 40%. In this study 6 cases (8.10%) had a positive family history of epilepsy, while this frequency varied from 1.6% to 9% in other studies.^{10,11} In the present study, 86.4% patients had generalized seizure that is similar to the other studies. In our study, 45 patients (60.8%) were suffering from simple febrile seizure, while this was between 60 to 90 percent in other studies. In a study conducted by D. Donaldson et al, 55% of seizures were simple and 45% were complex, which corresponds to our study.¹² In a study conducted by Fallah R. et al, it was noticed that in one-third of patients, there was complex febrile seizures.¹³ In a study by Essam J. Al-Zwaini in Iraq, 27% of cases had complex febrile seizures.¹⁴

In their study, it was also observed that the mean temperature during the first attack was reported to be 39.7°C, while in the present study one-half of patients had rectal temperatures between 38 and 39°C. In addition, the mean rectal temperature of patients in this study was 38.6°C. Compared to the Essam J. Al-Zwaini study, in which the history of prematurity was positive in 13 percent of cases. In our study, only 5.4% (4 patients) had a history of prematurity.¹⁴ Preterm neonates are also prone for neonatal seizures.¹⁵

In study by Norah A. Al Khathlan et al in 4 percent of cases signs and symptoms of meningitis existed and in 35 percent of cases no reason was specified for fever.¹⁶

Additionally, in a study by Essam J. Al-Zwaini, upper and lower respiratory tract infections were the causes of febrile illness in 67 percent of patients.¹⁴, while in the our study

22.9% of patients had febrile illnesses due to acute gastroenteritis, 13.5% of cases had Upper Respiratory Tract Infection (URTI) and 17.5% cases had Lower Respiratory Tract Infection (LRTI), 13.5% had fever due to urinary tract infection and 2.7% of all cases had fever caused by meningitis and in 16.2% of cases no cause was found. CSF analysis should be considered in patients of 12 to 18 months of age as symptoms and signs of meningitis may be subtle. Symptoms and signs of meningitis may also be masked in children with febrile seizures who have received antibiotics, hence CSF analysis is essential in cases of febrile seizures. The AAP also recommends CSF analysis in patients under 12 months of age presenting with fever and seizure, because signs of meningeal irritation may be minimal or absent in this age group.¹⁷ As we found few electrolyte abnormalities in our study among febrile seizure patients, it is recommended not to be done in all cases. Routine laboratory studies in patients with simple febrile seizures are discouraged by other authors also.^{18,19} There is no evidence that simple febrile seizures cause any structural damage to the brain or that children with simple febrile seizures are at risk for cognitive decline. Population based studies have shown that febrile seizures in early childhood do not have adverse effects on behaviour, scholastic performance and neurocognitive attention.²⁰

CONCLUSION

Early referral of patients with a positive family history of febrile seizures is recommended for early diagnosis and prompt treatment of the underlying aetiology. Febrile seizure is a common benign disorder of childhood and often resolves spontaneously without any sequel. Therefore, parental education, counselling and reassurance are the cornerstone of management and follow-up.

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