

Clinical Profile of Febrile Seizure Presenting to Pediatric Emergency Care: A Descriptive Study

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Abstract

Original Research Article

A cross sectional study was conducted to describe the clinical profile of children presenting to pediatric emergency services with febrile seizure. Children aged 6 months to 60 months presenting to the emergency department with a first episode of febrile convulsion were recruited for the study. Their baseline demographic and clinical data were recorded. A total of 35 children were enrolled in the study. The mean (SD) age of enrolled children was 18.49 (10.79) months. Majority was belonged to rural background [20 (57.1%)]. Most of the parents on seeing their child convulsing did nothing and immediately present to the doctor [26 (74.28%)] followed by massaging [8 (22.86%)]. The mean (SD) age at onset of seizure was 17.6 (11.0) months and mean (SD) no. of seizures were 1.9 (2.4). Moderate grade of fever was seen in most of the children [17 (48.6%)] and was associated with chills in 11 (31.4%) children. Maximum no. of children presented with the sign and symptom of Irritability [25 (71.4%)] followed by staring eyes [22 (62.9%)] and abnormal cry [16 (45.7%)]. The present study found that majority of children with febrile seizure had moderate degree of fever followed by generalized type of seizure. Most of them had no clear-cut focus of infection at the time of presentation.

Keywords: pediatric emergency services, febrile seizure, fever.

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INTRODUCTION

Febrile seizure is defined as the seizures accompanied by fever greater than 38°C in age group of 6 to 60 months who has an acute febrile illness, who has not experienced a prior seizure without fever and in whom intracranial infection or inflammation has been excluded [1]. Simple febrile seizure is brief lasting less than 15 min, generalized and non-recurrent [2]. A complex febrile seizure would be prolonged, focal or multiple. Other causes of fever with seizure in tropical countries include viral infection (HHV-6 or influenza), malaria and rarely acute bacterial meningitis [3].

Meningitis as a cause of fever with seizure needs emphasis as untreated or partially treated meningitis could be fatal. Although it is time tested practice to perform lumbar puncture in children less than 12-18 months presenting with febrile convulsion, however, recently its been debated whether to perform invasive investigation like lumbar puncture in such children [4]. For the diagnosis of meningitis, Lumbar puncture is done and pleocytosis is seen under microscope. But the procedure is invasive, requires expertise, cannot be performed at primary health care levels, and is off course painful. EEG and neuro imaging

should not be performed in evaluating a neurologically healthy child with simple febrile seizures [5].

Literature pertaining to clinical profile of children with simple febrile seizure is limited from India [6]. Considering the limited data on clinical profile, we conducted this study to describe the clinical profile of children with simple febrile seizures presenting to tertiary care center of North India.

METHODS

This descriptive study was conducted in the department of Pediatrics, Pt B D Sharma Postgraduate Institute of Medical Sciences, Rohtak, Haryana. Clearance was obtained from the institutional ethical committee. The study protocol was fully explained to the parents/guardian, and informed written consent was obtained.

Children aged 6 months to 60 months presenting to the emergency department with a first episode of febrile convulsion were recruited for the study. Children with cerebral palsy, developmental delay, autism, diagnosed neurological disorder and epilepsy were excluded from the study. Demographic data including name, age, gender, address, telephone

number were recorded. Similarly, parental profession, education and family income were also recorded and socioeconomic status was determined based on revised Kuppuswamy classification.

Clinical data including the history of fever, its duration, frequency of spikes of fever, relief with paracetamol was recorded. Focus of infection was determined as per the history. The type of seizure was elicited by the history and classified into focal and generalized seizures. Further subclassification into generalized tonic clonic, atonic, absence, myoclonic, simple partial seizure and complex partial seizure were also determined. Mean number of seizure and average duration of each seizure was also determined. The timing of seizure whether it occurred in day or night time was also recorded. Presence or absence of aura and postictal confusion was also noted.

Parental perception of the first seizure and the first aid measure for febrile seizure was recorded. History of vomiting, diarrhoea, ear discharge, crying during micturition was also elicited to depict the focus of

fever. Examination was performed among all enrolled children. Presence or absence of neck rigidity, meningeal signs, features of raised intracranial pressure were recorded. Similarly, signs of petechiae, jaundice, irritability, bulging fontanelle were also noted.

All the data were entered in MS Excel. All categorical variables were depicted as number, proportion and continuous variables presented as Mean (SD) or median (IQR). All the statistical analysis was performed using SPSS 15.0 version. *P* value <0.05 was considered to be significant.

RESULTS

Demographic Characteristics of Study Population

A total of 35 cases were enrolled in the study in which the majority of cases were male [23 (65.7%)]. The mean (SD) age of enrolled children was 18.49 (10.79) months. Majority was belonged to rural background [20 (57.1%)] and were residing 2.7 km far from the health centre. Only 1 child was school going in the enrolled cases (Table-1).

Table-1: Table depicting demographic characteristics of study population

| Demographic characteristics | | Values (N=35) |
|--|-----------|---------------|
| Age in months [Mean (SD)] | | 18.49 (10.79) |
| Gender [n (%)] | Male | 23 (65.7%) |
| | Female | 12 (34.3%) |
| Residence [n (%)] | Urban | 6 (17.1%) |
| | Semiurban | 9 (25.7%) |
| | Rural | 20 (57.1%) |
| Distance from health centre in kms [Mean (SD)] | | 2.77 (2.52) |
| Schooling [n (%)] | | 1 (2.9%) |

Sociodemographic Profile of Parents of Enrolled Children

In a group of 35 fathers and 34 mothers; majority of fathers were educated upto high school [16

(45.7%)] and were unskilled workers [15 (42.9%)] whereas majority of mothers studied upto middle school [13 (38.2%)] and were housewives/ unemployed [28 (82.4%)] (Table-2).

Table-2: Table depicting sociodemographic profile of parents of enrolled children

| Sociodemographic characteristics | | N | Values |
|----------------------------------|------------------------------|----|--------------|
| Father's age in yrs [Mean (SD)] | | 35 | 29.23 (3.99) |
| Mother's age in yrs [Mean (SD)] | | 34 | 25.35 (3.39) |
| Father's education* [n (%)] | Professionals/ Honours | 35 | 0 (0%) |
| | Graduate/ PG | | 1 (2.9%) |
| | Post high school | | 3 (8.6%) |
| | High school | | 16 (45.7%) |
| | Middle school | | 9 (25.7%) |
| | Primary school | | 0 (0%) |
| | Illiterate | | 6 (17.1%) |
| Mother's education* [n (%)] | Professionals/ Honours | 34 | 0 (0%) |
| | Graduate/ PG | | 1 (2.9%) |
| | Post high school | | 3 (8.8%) |
| | High school | | 5 (14.7%) |
| | Middle school | | 13 (38.2%) |
| | Primary school | | 3 (8.8%) |
| | Illiterate | | 9 (26.5%) |
| Father's occupation* [n (%)] | Profession | 35 | 0 (0%) |
| | Semiprofession | | 0 (0%) |
| | Clerical/ Shop owner/ Farmer | | 9 (25.7%) |
| | Skilled | | 4 (11.4%) |
| | Semiskilled | | 6 (17.1%) |
| | Unskilled | | 15 (42.9%) |
| | Unemployed | | 1 (2.9%) |
| Mother's occupation* [n (%)] | Profession | 34 | 0 (0%) |
| | Semiprofession | | 1 (2.9%) |
| | Clerical/ Shop owner/ Farmer | | 2 (5.9%) |
| | Skilled | | 0 (0%) |
| | Semiskilled | | 0 (0%) |
| | Unskilled | | 3 (8.8%) |
| | Unemployed | | 28 (82.4%) |

*As per revised Kuppuswami classification

Parental Perception to Seizure Event

Most of the parents on seeing their child convulsing did nothing and immediately present to the doctor [26 (74.28%)] followed by massaging [8

(22.86%)]. Water and Paracetamol was given to 7 (20%) and 28 (80%) convulsing children respectively. Lateral posturing was adopted only in 8 (22.9%) children (Table-3).

Table-3: Table depicting parental perception to seizure event

| Characteristics of parental perception | | Values (N=35) |
|--|--------------------------------|---------------|
| Parental response [n (%)] | Nothing, took them to hospital | 26 (74.28%) |
| | Massaged | 8 (22.86%) |
| | Went to quacks | 1 (2.86%) |
| | Sponged | 1 (2.86%) |
| Water given [n (%)] | | 7 (20%) |
| Lateral posturing [n (%)] | | 8 (22.9%) |
| Paracetamol given [n (%)] | | 28 (80%) |

Characteristics of Seizure

The mean (SD) age at onset of seizure was 17.6 (11.0) months and mean (SD) no. of seizures were 1.9 (2.4). Maximum type of seizure which is seen was

GT/GC/GTCS [28 (80%)] and were seen mostly at day time [30 (85.7%)]. Aura and post ictal state were present in 6 (17.1%) and 7 (20%) children respectively (Table-4).

Table-4: Table depicting characteristics of seizure

| Characteristics of seizure | | Values (N=35) |
|---|-----------------|---------------|
| Age at onset of seizure in months [Mean (SD)] | | 17.6 (11.0) |
| Type of seizure [n (%)] | GT/ GC/ GTCS | 28 (80%) |
| | Atonic | 1 (2.9%) |
| | Absence | 2 (5.7%) |
| | Myoclonic | 0 (0%) |
| | Simple partial | 1 (2.9%) |
| | Complex partial | 2 (5.7%) |
| Partial with secondary generalization | | 1 (2.9%) |
| Number of seizures [Mean (SD)] | | 1.94 (2.4) |
| Duration of seizures in hrs [Mean (SD)] | | 3.06 (2.06) |
| Time of seizure [n (%)] | Day | 30 (85.7%) |
| | Night | 3 (8.6%) |
| | Not specific | 2 (5.7%) |
| Aura [n (%)] | | 6 (17.1%) |
| Post ictal state [n (%)] | | 7 (20%) |

Characteristics of Fever

Moderate grade of fever was seen in most of the children [17 (48.6%)] and was associated with chills in 11 (31.4%) children. Most of them had no infection focus [22 (62.86%)] and in those children who were

found with any infection, focus was found to be respiratory in majority of cases 11 (31.43%). Out of 35 children; 14 (40%) had already started taking antibiotics prior to seizure (Table-5).

Table-5: Table depicting characteristics of fever

| Characteristics of fever | | Values (N=35) |
|--|--------------|---------------|
| Grade of fever [n (%)] | High | 12 (34.3%) |
| | Moderate | 17 (48.6%) |
| | Mild | 5 (14.3%) |
| | Undocumented | 1 (2.9%) |
| Chills [n (%)] | | 11 (31.4%) |
| Fever- Seizure interval in hrs [Mean (SD)] | | 2.86 (3.24) |
| Infection focus [n (%)] | Respiratory | 11 (31.43%) |
| | GI | 3 (8.57%) |
| | Ear | 1 (2.86%) |
| | Urinary | 0 (0%) |
| | None | 22 (62.86%) |
| | Chicken pox | 1 (2.86%) |
| Antibiotic taken [n (%)] | | 14 (40%) |

Signs & Symptoms

Maximum no. of children presented with the sign and symptom of Irritability [25 (71.4%)] followed by staring eyes [22 (62.9%)] and abnormal cry [16

(45.7%)]. Among 35 enrolled children, 11 (31.4%) children had multiple seizure and 9 (25.7%) of them had complex seizure.

Table-6: Table depicting Signs & Symptoms

| Sign & Symptom [n (%)] | Values (N=35) |
|-------------------------|---------------|
| Bulging fontanelle | 0 (0%) |
| Neck stiffness | 7 (20%) |
| Petechiae | 0 (0%) |
| Jaundice | 0 (0%) |
| Kernig sign | 2 (5.7%) |
| Brudzinski sign | 2 (5.7%) |
| Reduced feeds | 15 (42.9%) |
| Irritability | 25 (71.4%) |
| Staring eyes | 22 (62.9%) |
| Lethargic/ Drowsiness | 15 (44.1%) |
| Unconscious/ Coma | 8 (22.9%) |
| Abnormal cry | 16 (45.7%) |
| Multiple seizure | 11 (31.4%) |
| Change in mental status | 2 (5.9%) |
| Complex seizure | 9 (25.7%) |

Examination Findings in Febrile Convulsing Children

Most of the children had no motor deficit [31 (88.6%)]. Hearing or Vision loss was seen in 3 (8.6%)

cases. Facial dysmorphism was seen in 1 (2.9%) case. Cranial nerve palsy/ Microcephaly/ NC markers were not seen in any of the patients (Table-7).

Table-7: Table depicting Examination

| Characteristics of examination | | Values (N=35) |
|--------------------------------|---------------|---------------|
| Motor deficit [n (%)] | Hemiparesis | 2 (5.7%) |
| | Quadriparesis | 1 (2.9%) |
| | Paraparesis | 1 (2.9%) |
| | No deficit | 31 (88.6%) |
| Cranial nerve palsy [n (%)] | | 0 (0%) |
| Microcephaly [n (%)] | | 0 (0%) |
| NC markers [n (%)] | | 0 (0%) |
| Facial dysmorphism [n (%)] | | 1 (2.9%) |
| Hearing/ Vision defect [n (%)] | | 3 (8.6%) |

Development Delay and Relevant Histories

Majority of children had normal development. Delayed development in the form of motor and fine motor delay was seen only in 1 (2.9%) case. On elicitation, perinatal and postnatal history was found to be insignificant in all children. Family history was present in only 1 child. According to 6 (17.1%) parents of those enrolled children, their child had undergone through anticonvulsant therapy in the past.

DISCUSSION

The present study found that majority of children with febrile seizure had moderate degree of fever followed by generalized type of seizure. Most of them had no clear-cut focus of infection at the time of presentation. Most of parents just rushed the child to emergency cares services without exercising any first aid measures. Few even gave water during seizure or went to quacks before reaching appropriate medical attention. The present study brings forth the clinical profile of children who presented with first episode of febrile seizure.

Febrile seizures are considered as generalized seizures that follow febrile illness [7]. In majority of cases, febrile seizures follow upper respiratory tract infection or urinary tract infection [8]. In present study we found that majority of children had no clear focus of infection. Febrile seizures were earlier classified as typical febrile seizure and atypical febrile seizure. Typical febrile seizure was defined when the seizures were generalized, duration of less than 15 minutes and a single episode of seizure per fever. This terminology is now used for simple febrile seizure [4]. Majority of patients in the present cohort presented with simple febrile seizure.

Complex febrile seizures were considered when seizures were not generalized or there was more than one seizure per febrile illness, or the seizure duration was more than 15 minutes [9]. Presence of seizure more than

30-minute following fever is often labelled as febrile status epilepticus [10]. There are concerns of mesial temporal sclerosis and hippocampal atrophy following febrile status epilepticus [10] children who have more than one episode of simple febrile seizure would be provided with label of SFS+ which are often considered as SFS instead of complex febrile seizures [11].

Majority of them had moderate grade of fever at the time of seizure. Lower grades of fever are documented in 5 children and 1 had no documented fever. Occurrence of seizure following lower grades of fever is an independent risk factor for recurrence of febrile seizure [12]. Although, the present study did not have follow up of patients, it is difficult to predict the risk of recurrence.

Febrile seizures are known to occur in children aged 6 months to 5 years [13]. The mean age of enrolled children in present study was 17.6 months. Majority of them presented with generalized seizures. However, as per the history 3 children had focal with 1 having simple partial seizure and 2 having complex febrile seizure. Presence of focal febrile seizure increases the risk of future risk of epilepsy. This often warrants long term antiepileptic drugs.

It was surprising to observe that majority of parents did not even adopt recovery position while child thrown a seizure. This was quite obvious considering that we enrolled only those with first seizure. Parental anxiety often obscures the importance of recovery position for seizure. Moreover, majority of enrolled patients lived in the vicinity of 2 km from the hospital.

CONCLUSION

The present study revealed the clinical profile of children with febrile convulsion with majority of them being simple febrile seizure and few with focal febrile seizure. Majority of them did not have focus of infection.

The present study provides insight into clinical profile of Indian children with febrile seizure.

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