



A STUDY ON FEBRILE CONVULSIONS WITH SPECIAL REFERENCE TO INCIDENCE OF BACTERAEMIA

Paediatrics

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ABSTRACT

Background: Febrile seizures are the most common cause of convulsions in children. Although most febrile seizures are benign, it is critical that the child be evaluated immediately to reduce parental anxiety and to identify the cause of fever. It is essential to exclude underlying pyogenic meningitis, either clinically or if any doubt remains, by lumbar puncture. **Aim:** This study will aim at documenting the incidence, clinical picture and evidence of bacteremia in febrile convulsions.

Objectives Of The Study:

1. To understand the precipitating factors for Febrile Convulsions.
2. To find out the incidence of occult bacteraemia in case of febrile convulsions.
3. To know the incidence of febrile convulsions in relation to different age groups, sex of the child, seasonal variation and with positive family history of febrile convulsions.
4. To find out the difference in incidence of bacteraemia in simple and complex febrile Seizures.

Methods: 54 children in the age group of 6 months to 5 years admitted to paediatric ward and icu with history of fever with convulsions, in GSL Medical College and General hospital from June 2021 To May 2022 were taken up for the study. All subjects were examined and investigated to find the precipitating factor and cause for febrile convulsions. **Results:** Incidence of febrile convulsions was more in children less than 2 yrs of age (66.66%) with male predominance (57.40%). Anaemia was noticed in 57.40%, Leucocytosis was seen in 55.55%. Blood culture showed no growth in 87% of the cases. 7 cases (13%) showed growth in blood culture with one case (1.85%) growing *Streptococcus Pneumoniae* and the rest of the cases (11.1%) showed Coagulase Negative *Staphylococcus Aureus* as the organism on blood culture. **Conclusion:** Even though viruses are the major etiological agents for febrile convulsions, occult Bacteraemia should be ruled out in all the cases of febrile convulsions especially those under the age of 2 years.

KEYWORDS

febrile convulsions, bacteraemia

INTRODUCTION

It was not until 1980 that febrile seizures were recognized as a distinct clinical entity, separate from other types of convulsions in early childhood.

There are 2 operational definitions of febrile seizures:

1. The National Institute of Health Consensus Statement (1980) defines a Febrile Seizure as "an event in infancy or childhood usually occurring between months & 5 years of age, associated with fever but without evidence of intracranial infection or defined cause for the Seizure"
2. International League Against Epilepsy (1993) defines a Febrile Seizure as "a Seizure occurring in childhood between 1 month and 5 years of age, associated with Febrile illness not caused by an infection of the Central Nervous System, without previous neonatal seizures or a previous unprovoked seizure and not meeting criteria for other acute symptomatic seizure"

An axillary temperature of more than 38°C as a simple cut off level is considered during diagnosis of a febrile seizure, but there is still no consensus.

Between 2-5% of children in Europe and US experience at least one Febrile Seizure before the age of 5 yrs, being more common in boys. Indian studies suggested that upto 10% of children experience a Febrile Seizure. Recent data indicate that the incidence rate in India is similar to western countries.

Types of Febrile Seizure:

1. Simple:

A simple Febrile Seizure is a generalized seizure (without focal features) which lasts less than 15 min & occurs only once during a 24 hour period of fever in a neurologically normal child.

2. Complex:

A Complex Febrile Seizure is defined as a Febrile Seizure with one or more of the following features:

- A focal onset or shows focal features during the seizure or is followed by a neurological deficit or

- Prolonged duration (> 15 min).
- Recurrent within 24 hour or within the same febrile episode.
- The child has a previous neurological impairment.
- Various studies have shown that incidence of Complex Febrile Seizures is between 9 to 35%

Causes of Febrile Seizures

- Febrile Seizures tend to occur in families & this genetic susceptibility can be transmitted through both parents
- A positive family history for Febrile seizures can be elicited in 25-40% of children with febrile seizures and the reported frequency in their sibling ranges from 9-22%
- Studies show higher concordance rate in Monozygous as compared to Dizygotic twins
- In recent times, linkage studies in several large families in Japan have mapped the FS susceptibility genes to two putative loci. FEB1 (chromosome 8q13 – q 21) and FEB2 (chromosome 19p13.3) indicating an autosomal dominant pattern with reduced penetrance
- Children with Febrile Seizure have been reported to have Iron deficiency Anemia as well

AIM:

This study will aim at documenting the incidence, clinical picture and evidence of bacteremia in febrile convulsions.

Objectives Of The Study:

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- To find out the incidence of occult bacteremia in case of Febrile convulsions.
- To know the incidence of febrile convulsions in relation to different age group, sex of the child and seasonal variation.
- To know the incidence of febrile convulsions with family history of febrile convulsions.
- To find out the difference in incidence of bacteremia in simple and complex febrile seizures

METHODOLOGY:

Source Of Data -

54 children in the age group of 5 month to 5 years admitted to pediatric emergency ward with history of fever with convulsions, in GSL Medical College and General Hospital from November 2009 To September 2011 were taken up for the study.

Method Of Collection Of Data:

Inclusion Criteria -

Neurologically normal children in the age group of 3 month to 5 years presenting to the hospital with Febrile convulsions.

Exclusion Criteria:

- Who have history of Afebrile Seizures.
- Those who have received antibiotics prior to hospitalization.
- Past history of Neonatal Seizures.
- Static / Progressive neurological disorder.

Clinical History

- Patients Name, Age, Sex.
- History of fever.
- History of precipitating factors (like URTI, LRTI, AGE, UTI, Ear Infection etc).
- Duration of convulsion.
- Type of convulsion.
- Frequency of convulsion.
- Family history of Febrile Seizure, Epilepsy.
- History of Birth Asphyxia / developmental delay.

Clinical Examination -

A detailed general & systemic examination will be done in all cases to find out the foci of infection.

Laboratory investigations:

- Necessary investigations were done by obtaining informed consent from the patients' parents.
- Complete blood count with Peripheral blood smears.
- Blood culture & sensitivity.
- Urine routine and microscopy, culture and sensitivity (if required).
- Stool routine & microscopy, culture and sensitivity (if required)
- CSF analysis in
- Children < 18 months of age
- Undue or unexplained drowsiness or irritability.

Statistical analysis -

No statistical method was applicable for the present study as there was no control group in the study. Hence results are expressed in percentage.

RESULTS AND ANALYSIS:

The results are expressed in percentage as the study didn't have any control group; no statistical method was applicable for the present study.

Table – 1: Percentage of cases with Age Distribution Total no of cases: 54

Age in months	No. of cases (n=54)	Percentage
3-12	14	25.92%
13-24	22	40.74%
24-36	08	14.81%
36-48	05	9.25%
48-60	05	9.25%

Among 54 children in the study group, 14(25.92%) of them were between the age group of 3 to 12 months, 22 (40.74%) of them were between 13 months to 24 months. Most of the children in the study group were below 24 months of age i.e 36 children (66.66%).

Table– 2: Percentage of cases with Sex Distribution

Sex of the child	No. of cases (n=54)	Percentage
Male	31	57.40%
Female	23	42.59%

Among the 54 children studied, febrile convulsion was noticed in 31 males (57.40%) and 23 females (42.59%).

Table– 3: Percentage of cases with Duration of convulsions

Duration of convulsions	No. of cases (n=54)	Percentage
Less than 15 mins	49	90.74%
More than 15 mins	05	9.26%

In the study group of 54 children, 49 cases had typical febrile convulsions which lasted for less than 15 minutes and 5 cases had atypical febrile convulsions which lasted for more than 15 minutes.

Table– 4: Percentage of cases with Organisms isolated in blood culture

Blood culture	No. of cases(n=54)	Percentage
No growth	47	87%
Bacteremia	07	13%

Organism	No. of cases(n=54)	Percentage
No growth	47	87%
Streptococcus pneumonia	01	1.85%
Coagulase negative Staphylococcus	06	11.1%

Out of the 54 cases studied, blood culture yielded growth in 7 cases. Most of the cases (87%) showed no growth in blood culture. One growth was Streptococcus Pneumoniae and the rest were Coagulase negative Staph. aureus (contaminant).

Other inferences:

- Family history of convulsions was positive in 14 of the 54 cases of which 9 had family history of febrile convulsions and 5 had family history of epilepsy
- 2 peaks during the month of May and August and number of cases were least during the months of November, December and January.

DISCUSSION

In our study conducted in Department of Pediatrics at Dr B.R.Ambedkar Medical College Hospital from November 2009 To September 2011, 54 children in the age group of 3 months to 5 years with febrile convulsions were studied. Observations have been made and compared to the similar studies which were done earlier.

In the present study the majority of cases were seen in the age group of 13-24 months. Incidence of infection is also more in this age group because of immaturity of immunological function. As the age increases the incidence of febrile convulsions were less which can be explained by the fact that maturity and myelination of brain progressively increases.

In the present study, febrile convulsions were noticed in 31 males (57.40%) and 23 females (42.59%); the ratio being 1.3: 1 In the present study two peaks were seen for the occurrence of febrile convulsions-one during the month of May and the other during the month of August. This can be explained most probably by the fact that diarrhoeal disorders are noticed more commonly during the months of April & May and respiratory infections are noticed during the month of August.

Among the symptoms, Rhinorrhoea, cough and diarrhoea were significant. Vomiting and rash occurred in 1 case each. The majority of symptoms were of the upper respiratory tract. In the present study majority of children presented with Rhinorrhoea (59.25%) which dominated as the cause of fever leading to febrile seizure. Our study showed nearly 24.07% of children with diarrhoea as compared to other studies where diarrhoea accounted for 7-8% of the cases.

Of the 54 cases, 47 cases did not yield any growth on blood culture. Of the 7 cases with bacteraemia, only 1 case had significant bacteraemia which had Streptococcus pneumoniae as the infecting organism. The other 6 cases grew Coagulase negative Staphylococcus Aureus as the organism which was a contaminant.

The child with significant bacteraemia with Streptococcus Pneumonia as the infecting organism also had Leucocytosis with Neutrophilia, toxic granules in neutrophils. The child with significant bacteraemia was in the age group of less than 2 years. Though majority of febrile convulsions are due to viral infection, occult bacteraemia forms a small but significant percentage in children presenting with febrile convulsions, especially those less than 2 years.

The risk of child developing epilepsy at a later age is more with a family history of afebrile convulsions.

CONCLUSION:

- Even though viruses form major etiological agents for febrile convulsions, occult bacteraemia should be ruled out in all children

- presenting with febrile convulsions.
- The presenting symptoms can be as innocuous as Rhinorrhea or cough.
- Blood culture as a routine, should be done in all children presenting with febrile convulsions especially those less than 2 years of age. In the study group, bacteremia was ruled out by doing blood culture once for all the cases.
- Streptococcus pneumoniae* was the organism isolated in a child with febrile convulsion with significant bacteremia who had respiratory tract infection.
- The child with significant Bacteremia had presented with simple febrile convulsions and was 1 year old.
- Children with a positive family history of afebrile convulsion should be followed up and evaluated closely as they can develop epilepsy at a later date.
- Anaemia was an incidental finding in children (57.40%) who presented with febrile convulsions.
- The children who presented to us with febrile convulsions especially with gastroenteritis, none of them had dyse lectrolytemia.
- In the study group, none of them had refractory seizures.
- Since the children in the study group (54) were less in number, there is a need to study large number of children with febrile convulsions to find out the possible role of bacterial infection in the occurrence of febrile convulsions especially in those children less than 2 years of age.

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