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A PROSPECTIVE OBSERVATIONAL STUDY ON ASSESSMENT, EVALUATION AND MANAGEMENT OF FEBRILE SEIZURE RECURRENCE IN PEDIATRIC DEPARTMENT, GGH, GUNTUR

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ABSTRACT

This observational study is to manage the febrile seizure recurrence and its impact on children with the age of 6 months to 5 years. This study was done to assess and evaluate the febrile seizure recurrence and its management. A six months prospective observational study is suggested at the Government General Hospital, Guntur. The data was collected from 71 children in Paediatric ward based on inclusion and exclusion criteria. In our study we screened 71 children for Febrile Seizure recurrence, out of 71 children with the age of 6 months to 5 years has febrile seizure recurrence and the second born child has more chances of febrile seizure reoccurrence. We concluded from our observational study that febrile seizures are more likely in children aged 6 months to 5 years. According to our findings, both the firstborn and second born children have an identical chance of having a febrile seizure recurrence, and diazepam-treated children had a lower risk of having a febrile seizure recurrence. Normally, a febrile seizure patient would be treated with antipyretics and antiepileptic drugs in a hospital setting, after which the kid would be discharged and the parents would be warned about the dangers of antiepileptic medications. Our findings suggest that intermittent antiepileptic therapy, particularly benzodiazepines like diazepam, can minimize the risk of febrile seizure recurrence.

Keywords: Febrile seizures, Recurrence, Diazepam, Family history, Age, Generalized seizure

1. INTRODUCTION

1.1.Definition: Around the globe, febrile seizures are convulsions that occur in a child who is between six months and five years of age and has a temperature greater than 100.4ºF (38ºC). Febrile seizures occur in children between 12 and 18 months of age **[1-8]**.

1.2. Types of Febrile Seizure:

1.2.1. Simple Febrile Seizure:

Simple febrile seizure has been defined by The International League Against Epilepsy as "A short generalized seizure, of a duration of <15 min, not recurring within 24 h, occurring during a febrile episode not caused by an acute disease of the nervous system, in a child aged 6 months to 5 years, with no neurologic deficits (i.e., with no pre-, peri-, or post-natal brain damage, with normal psychomotor development, and with no previous afebrile seizures). Fever may not be detected before the seizure, but it must be present at least in the immediate post-acute period and be the symptom of a paediatric disease." **[2-15]**

1.2.2. Complex Febrile Seizure:

Complex febrile seizure (CFS) has been defined as "A focal, or generalized and prolonged seizure, of a duration of >15 min, recurring more than once in 24 h, and/or associated with postictal neurologic abnormalities, more frequently a postictal palsy (Todd's palsy), or with previous neurologic deficits." If the CFS is characterized by a duration of >30 min, or by shorter serial seizures, without consciousness being regained at the interictal state, the disorder is named febrile status epilepticus.

1.3.Epidemiology:

However, there is a 15 to 70 percent risk of recurrence in the first two years after an initial febrile seizure. This risk is increased in patients younger than 18 months and those with a lower fever, short duration of fever before seizure onset, or a family history of febrile seizures. Continuous or intermittent antiepileptic or antipyretic medication is not recommended for the prevention of recurrent febrile seizures **[3, 16-39]**.

1.4. Etiology: [4, 40-49]

Febrile seizures occur with a fever higher than 38^0C or 100.4 F and no other seizure-provoking etiologies such as described above. The highest fever necessary to cause febrile seizures is specific to the individual as each child's threshold convulsive temperature varies. While the degree of fever is ultimately the most significant factor in febrile seizures,

these seizures often occur as the patient's temperature is rising. In fact, a febrile seizure may be the first sign that a child is ill, with the presence of fever greater than 38 degrees discovered shortly after that. There is no specific cause of fever that is more likely to cause febrile seizures, however, viral rather than bacterial infections are commonly associated with febrile seizures. A particular virus, HHV-6, is commonly associated with febrile seizures in the United States and European countries. In Asian countries, influenza A virus has been frequently associated with febrile seizures. Any fever of adequate height may cause a febrile seizure **[4, 50-55]**.

1.5.Causes Of Febrile Seizures: [5, 56-58]

Infection — febrile seizures can occur because of the fever that accompanies bacterial or viral infections, especially human herpesvirus-6 (also called roseola or sixth disease).

Immunizations — Fever can occur as a side effect of certain vaccines, particularly after measles mumps rubella (MMR) vaccination. The fever typically occurs 8 to 14 days after the injection.

1.6. Risk Factors:

The main risk factors for epilepsy in that area of the world were:

- Family history of seizures.
- Previous febrile seizures.
- Perinatal trauma.
- Head injury.
- CNS infections, such as NCC(Neurocysticercosis) **[6]**

1.7. Diagnosis

Febrile seizures occur in children with normal development. The medical history and developmental history exclude other risk factors for epilepsy. In normally developing children, identifying the cause of your child's fever is the first step after a febrile seizure.

1.7.1. Simple febrile seizures

- Children who are current with their vaccinations who have a first simple febrile seizure don't need testing, they can be diagnosed the febrile seizure based on history
- In children with a delayed vaccination schedule or a compromised immune system may recommend tests to look for severe infections: blood test and urine test.
- A spinal tap (lumbar puncture), can help the child has a central nervous system infection, (such as meningitis).

1.7.2. Complex febrile seizures: To diagnose the cause of a complex febrile seizure, chid may be recommend an;

- Electroencephalogram (EEG), a test that measures brain activity.
- MRI to check the child's brain if the child has:
    1. An unusually large head and abnormal neurological evaluation.
    2. Signs and symptoms of increased pressure in the skull and a febrile seizure that lasted an unusually long time **[8, 59]**.

1.8. PHARMACOLOGICAL TREATMENT:

Table 1: Drugs commonly used for children with febrile seizures (FS) who present to the Emergency Room

Name	Dosage	Administration Route	Frequency	Maximum Dosage	When Used
Paracetamol	**15 mg/kg**	**Oral, rectal or intravenous (IV) during resuscitation**	**Every four to six hours**	**Five within 24 h**	**For pyrexia in children with FS**
Ibuprofen	**5–10 mg/kg**	**Oral**	**Every six to eight hours**	**Four within 24 h**	**For pyrexia in children with FS unless they are dehydrated**
Diazepam	**0.25 mg/kg 0.5 mg/kg**	**IV or intraosseous Rectal**	**A second dose may be given ten minutes after the first**	**Only two doses of benzodiazepines are to be used, regardless of the agent selected and if they are administered alone or in combination**	**For an actively convulsing child whose seizures have lasted more than five minutes**
Lorazepam	**0.1 mg/kg**	**IV**	**A second dose may be given ten minutes after the first**	**Only two doses are to be used**	**For an actively convulsing child whose seizures have lasted more than five minutes**
Midazolam	**0.15–0.2 mg/kg**	**IV**	**A second dose may be given 10 min after the first**	**Only two doses are to be used**	**For an actively convulsing child whose seizures have lasted more than five minutes**
0.9% sodium chloride solution	**20 ml/kg**	**IV**	**During resuscitation**	**More than two doses are rarely required**	**In children with shock, for example, in febrile illness due to gastroenteritis**

Long-term antiepileptic drugs are not generally prescribed as prophylaxis for FS, as it has been demonstrated that they do not reduce the risk of developing epilepsy, and their potential side effects outweigh their potential benefits

On some occasions, benzodiazepines, such as rectal diazepam or buccal midazolam, can be prescribed for use at home as a rescue therapy

to stop seizures. Benzodiazepines can be used in children who present with frequent FS in a short period or for FS that last more than 15 min, if antiepileptic drugs have previously been required to stop the seizures.

1.9. METHODOLOGY

Study site: The study was conducted in Government General Hospital at Guntur.

Study duration: The study was carried over a period of six months.

Study design: This is an observational study design for the assessment, evaluation and management of febrile seizure recurrence.

Study criteria: The study was carried out by considering the following criteria

Inclusion criteria: Age between 6months - 5 years of both sexes (as per WHO guidelines), those with valid date of birth, febrile seizure recurrence.

Exclusion criteria: Children older than 18years, one episode of febrile seizures.

Sample size: In our study we have collected data from 71 subjects based on inclusion and exclusion criteria.

Statistical analysis: Descriptive data were expressed as frequency and percentage, we used student t-test to compare continuous variables in a graph pad prism, Microsoft excel was used at Chalapathi Institute of Pharmaceutical Sciences (Autonomous), Department of Pharmacy Practice, Government General Hospital, Guntur to analyse data. All tests were two tailed and the level of significance was set at $P<0.05$ with 95% confidence interval.

1.10. RESULTS

1.10.1. AGE:

An observational study was conducted in Government General Hospital, Guntur, Andhra Pradesh, for six months. The data was collected from 71 children in Paediatric ward based on inclusion and exclusion criteria. In our study we screened 71 children for Febrile Seizure recurrence, out of 71 children 17(23.98%) were of age group 6-12 months, 4(5.63%) were of age group 12-18 months, 5(7.04%) were of age group 18-24 months, 1(1.41%) were of age group 24-30 months, 11(15.49%) were of age group 30-36 months,9(12.68%) were of age group 36-42 months, 11(15.49%) were of age group 42-48 months, 6(8.45%) were of age group 48-54 months and 7(9.86%) were of age group 54-60 months, results shown in **Figure 1**.

1.10.2. Gender: Out of 71 students, 47(66.20%) were male and 24(33.80%) were female.

1.10.3. Type of Seizure: Out of 71 students, 58(81.69%) were diagnosed with Simple Febrile Seizure and 13(18.31%) were diagnosed with Complex Febrile Seizure.

1.10.4. Onset of Seizure: Out of 71 children, 41(57.75%) had their first Febrile Seizures at the age of 6-12 months, 8(11.27%) had their first Febrile Seizures at the age of 12-18 months, 11(15.49%) had their first Febrile Seizures at the age of 18-24 months, 2(2.82%) had their first Febrile Seizures at the age of 24-30 months, 2(2.82%) had their first Febrile Seizures at the age of 30-36 months, 1(1.41%) had their first Febrile Seizures at the age of 36-42 months, 2(2.82%) had their first Febrile Seizures at the age of 42-48 months, 2(2.82%) had their first Febrile Seizures at the age of 48-54 months and 2(2.82%) had their first Febrile Seizures at the age of 54-60 months, results were shown in **Figure 2**.

1.10.5. Child: Out of 71 children, 33(46.48%) are first born and 38(53.52%) are second born children.

1.10.6. Family History: Out of 71 children, 23(32.39%) children had the positive family history of Febrile Seizures, and 48(67.61%) children had the negative family history of the Febrile Seizures.

1.10.7. Child Active: Out of 71 children, 67(94.37%) children with Febrile Seizures are active, 4(5.63%) children with Febrile Seizures are inactive.

1.10.8. Consanguineous: Out of 71 children, 15(21.13%) children parents marriage is consanguineous, 56(78.87%) children parents' marriage is nonconsanguineous.

1.10.9. Delivery: Out of 71 children, 39(54.93%) were born by normal delivery, 32(45.07%) were born by caesarean.

1.10.10. Seizure During Past Years: Out of 71 children, 30(42.25%) children have not experienced seizure episode in past years, 35(49.30%) had experienced one episode of seizure, 5(7.04%) had experienced two episodes of seizures, 1(1.41%) had experienced fifty four episodes of seizures in past years.

1.10.11. Rescue Medication: Out of 71 children, 65(91.55%) were prescribed with rescue medication, 6(8.45%) were not prescribed with rescue medication.

1.10.12. Last Seizure: Out of 71 children, 39(54.93%) had the last Febrile Seizure in between 0-10 months, 7(9.86%) had the last Febrile Seizure in between 10-20 months, 18(25.35%) had the last Febrile Seizure in between 20-30 months, 2(2.82%) had the last Febrile Seizure in between 30-40 months, 5(7,04%) had the last Febrile Seizure in between 40-50 months, results were shown in **Figure 3**.

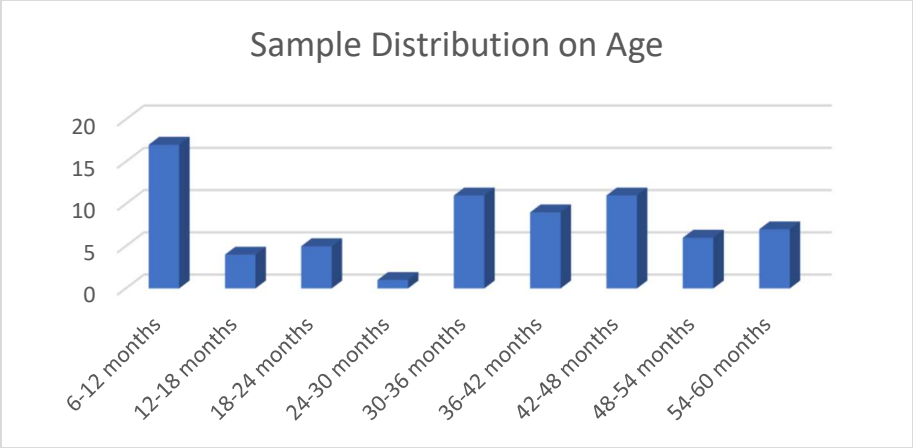

Figure 1: Sample Distribution Based on Age

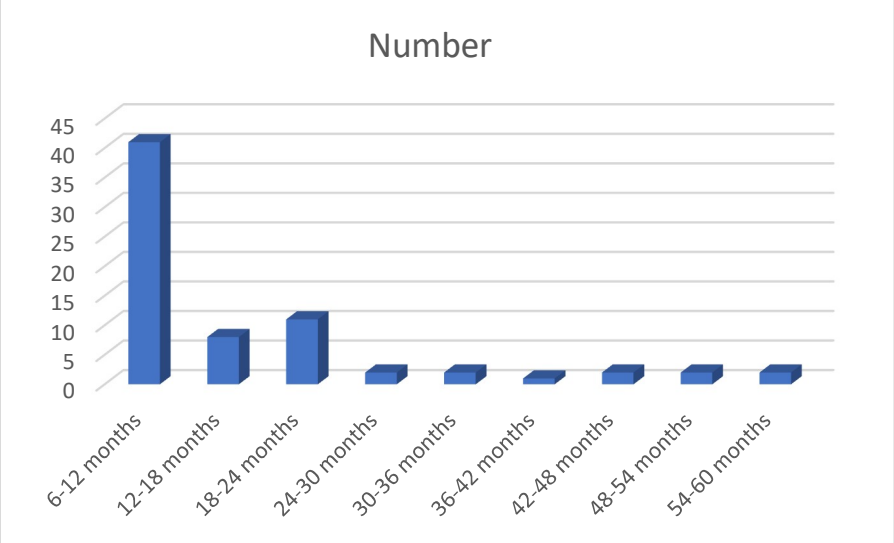

Figure 2: Sample Distribution Based on Onset of Seizure

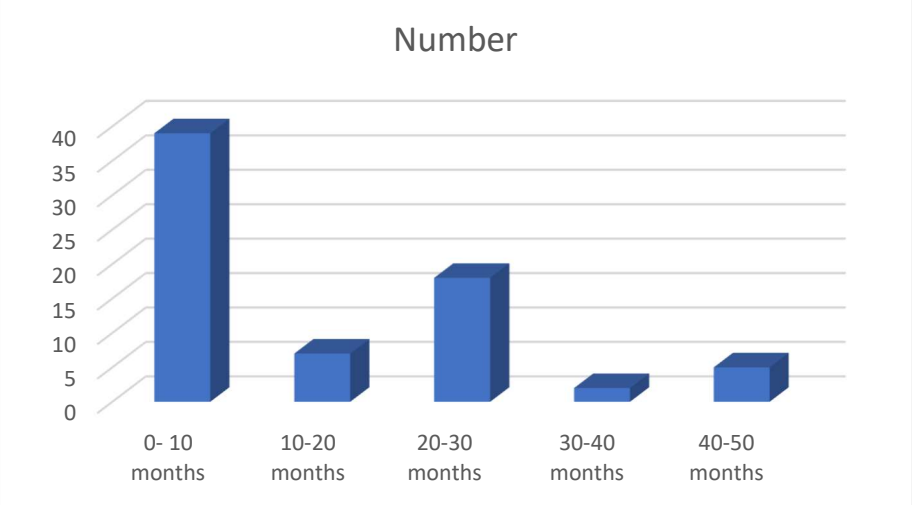

Figure 3: Sample Distribution Based on Last Seizure

1.11. DISCUSSION

Febrile seizures are more common in children. Many of those who develop epilepsy start with seizures during childhood, but it can develop at any age sometimes the exact cause of epilepsy is a mystery.

Febrile seizures are more common in children than in any other age group. In fact, there are several kinds of seizures that affect only children. Out of which febrile seizures are observed mainly. Other seizures that affect children may develop into epilepsy but however febrile seizures have reduced chance to develop into epilepsy. on the other hand in febrile seizures, seizures develop with a sign of fever.

The patient groups were classified according to their age. The febrile seizures were more prevalent in children age of 6 months – 5 years (99%).

More than sixty percent patients were male (66.20%) and female (33.80%), boys tend to be more prone than girls. It has been observed that (81.69%) had simple febrile seizure and (18.31%) had complex febrile seizure. Fever is the most common pre initiating cause of febrile seizure in children.

From our study, febrile seizures are observed in children, born as a second child of a mother (53.52%), normal delivery of mother - (54.93%) were common in children.

Most febrile seizures are controlled by antiepileptic drugs and adjuvant therapies prescribed by physicians. When prescribing pattern was analysed it was observed that paracetamol syrup TID followed by antiepileptic syrup is prescribed to a child.

Therefore, the physicians are more concentrating to reduce the temperature of the fever thereby controlling the seizure episode.

Finally, we observed that after seizure reduction and temperature control, the child was discharged from the hospital and advised to take only antipyretics and strictly warned against antiepileptic drugs due to harmful side effects.

1.12. SUMMARY

- Febrile seizures are commonly observed in age between 6 months to 5years.
- However, there is a 15 to 70 percent risk of recurrence in the first two years after an initial febrile seizure.
- Our study evaluates that both first born as well as second born child are having equal chances of febrile seizure recurrence.
- There is no statistical difference of febrile seizure recurrence between males and females. Both the genders have equivalent risk of febrile seizure recurrence.

- Our study states that diazepam taken children are having reduced chances of febrile seizure recurrence compared to other antiepileptic drugs.
- Prolonged antiepileptic therapy causes harmful side effects to a child rather than prolonged therapy, intermittent therapy of benzodiazepines (diazepam) can reduce the chances of febrile seizure recurrence.

1.13. ACKNOWLEDGMENTS

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