ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 16, Issue 5, 2023

Online - 2455-3891
Print - 0974-2441

Research Article

CLINICAL PROFILE OF CHILDREN WITH FEBRILE SEIZURE IN A TEACHING HOSPITAL

DHODI PRIYANISHABEN, ZUBAIR KHAN, PUSHPARAJ PATIL*

Department of Pediatrics, NAMO Medical Education and Research Institute, Silvassa, India. Email: piyush.patil05@gmail.com

Received: 19 December 2022, Revised and Accepted: 05 February 2023

ABSTRACT

Objectives: To find out the clinical feature and outcomes of febrile seizures.

Methods: After written informed consent, detailed clinical history of each patient including a time of presentation, the onset of fever and associated symptoms, data regarding demographic details, duration and type of seizure, history of seizures, and antiepileptic drug, repetition of seizure within 24 h, past history of seizures, birth history, family history was taken and entered in predesigned pro forma. Collected data were checked and verified for correctness and accuracy, which was then analyzed using statistical methods.

Results: In the present study male-to-female ratio was 1.75:1. The maximum number (82.5%) of patients lacked a family history of febrile seizure, while 17.5% of patients had a positive family history of FS. 70% of the pediatric patients had upper respiratory tract infection. The maximum number of patients had simple febrile seizures, which are 81.25%, whereas 18.75% of patients had complex febrile seizures. The majority (73.75%) of patients in the present study had anemia. WBC count >11×109/L was found in 45 patients out of 80 (56.25%), and WBC count<4.5×109/L was found in 6 out of 80 (7.5%).

Conclusion: Majority of patients with febrile seizures presented at a younger age which might represent the vulnerability of the developing brain to fever. As all the patients were discharged without any complication, so this study further adds to the knowledge of the benign nature of this disease.

Keywords: Complex febrile seizure, Simple Febrile seizures, White blood cells.

 DOI: http://dx.doi.org/10.22159/ajpcr.2023v16i5.47106. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Febrile seizures occur in 2–5% of all children between 6 months to 5 years of age, with peak incidence at 18 months of age and low incidence before 6 months and after 3 years [1].

Febrile seizures are generally defined as seizures occurring in children typically 6 months to 5 years of age in association with a fever greater than 38°C (100.4°F), who do not have evidence of an intracranial cause (e.g., infection, head trauma, and epilepsy), another definable cause of seizure (e.g., electrolyte imbalance, hypoglycemia, drug use, or drug withdrawal), or a history of an afebrile seizure [2,3].

A child with neurodevelopment abnormalities may also have febrile convulsion but they were kept out of the definition of febrile seizures as there was a difference in opinion regarding the type of underlying abnormality [4,5].

A febrile seizure is further classified into either simple or complex [3]. Simple febrile seizure is defined as a generalized tonic and clonic activities without a focal component, lasting <15 min and without recurrence within 24 h (± within the same febrile illness). Complex, atypical, or complicated febrile seizure (CFS) is defined by having the following features: partial onset or focal features, and/or duration longer than 15 min, and/or recurrence within 24 h, and/or association with postictal neurological abnormalities, such as Todd's paresis [6,7].

The genetic contribution to the incidence of febrile seizures is manifested by a positive family history of febrile seizures in many individuals of the same families. The disorder is proposed to be inherited as an autosomal dominant trait and multiple single genes that cause the disorder have been identified in such families, namely Feb 1,2,3,4,5,6,7,8,9,10 genes [8].

Seizures being a horrifying experience for parents can lead to physical and psychological manifestations. Common physical symptoms experienced by parents following their child's febrile seizure include dyspepsia, anorexia, and sleep disruption [9-11].

So this study is carried out to find out the clinical feature and outcomes of febrile seizures, so that appropriate parental education and precautionary measurement can be instituted.

METHODS

Study design

Hospital-based cross-sectional study.

Study population

All children admitted to the pediatrics ward at a tertiary care center (Govt. Medical College, Yavatmal, Maharashtra, India) fulfilling inclusion criteria during the 1-year study from 1 January 2019 to 30 December 2019.

Sample size –80 calculated by following formulae:

$N=z^2\ p(1-p)/d^2$

Z-1.96 for 95 % confidence interval, expectable range of error,

D=precision, p=expected prevalence.

Inclusion criteria

Children between 6 months to 5 years of age presented with febrile seizures.

Exclusion criteria

Patient with fever with intracranial infection, chronic neurological condition, metabolic abnormalities, hemodynamically unstable, status epilepticus.

Data collection procedure

- In this observational study, after written informed consent detailed clinical history of each patient, including a time of presentation, the onset of fever and associated symptoms, data regarding demographic details,

duration and type of seizure, history of seizures, and antiepileptic drug, repetition of seizure within 24 h, past history of seizures, birth history, family history was taken and entered in predesigned proforma.

- Patient history taking was followed by a complete physical examination.
- Patients with febrile seizures were analyzed with blood investigation like CBC, serum urea, serum creatine, serum electrolyte, serum calcium, random blood sugar level, urine examination, fundoscopy, lumber puncture, chest X-ray, ct brain depending upon the clinical features and need for evaluation.
- Blood culture was sent when there was no localizing sign of infection.
- All details entered in predesign pro forma and results were analysed.

Data management and analysis

The data was entered in Microsoft Excel sheet 2007, and the result was analyzed using SPSS software version 20.

Collected data were checked and verified for correctness and accuracy, which was then analyzed using statistical methods. Fisher's exact test performed for family history of febrile seizures ($p<0.05$ significant).

Ethical consideration

Informed consent was taken from the parents of the children in the study. Advance clearance and approval for undertaking the subject study were obtained from Institutional Ethical Committee. It was ensured that no harm was done to any of the participants during the study. Strict confidentiality was maintained for the data and personal details collected during the study.

OBSERVATIONS AND RESULTS

Variables	n (%)	p-value
Age		
6–12	4 (5)	>0.05
13–36	62 (77.5)	
37–60	14 (17.5)	
Gender		
Male	51 (63.75)	>0.05
Female	29 (36.25)	
Occurrence of convulsion with the respective duration of fever		
Less than 24 h	55 (68.75)	
More than 24 h	25 (31.25)	
Family history of febrile seizure		
Yes	14 (17.5)	<0.05
No	66 (82.5)	
Type of febrile seizure		
Simple	65 (81.25)	<0.0002
Complex	15 (18.75)	
Underlying etiology		
Upper respiratory tract infection	56 (70)	
Lower respiratory tract infection	9 (11.25)	
Positive blood culture	8 (10)	
Acute gastroenteritis	4 (5)	
Urinary tract infection	1 (1.25)	
Malaria	1 (1.25)	
Cause not determined	1 (1.25)	
Hemoglobin level		
<11 mg/dL	59 (73.75)	<0.05
>11 mg/dL	21 (26)	
CSF examination		
Normal	80 (100)	
Abnormal	0	
WBC count		
>11×109/L	45 (56.25)	
<4.5×109/L	6 (7.5)	
Normal	29 (36.25)	

CSF: Cerebrospinal fluid

In the present study, majority of the patients (77.5%) belonged to ages between 1 and 3 years. The mean age of the patients was 28.30±11.26 months.

In the present study, more patients were male than female, and the male-to-female ratio was 1.75:1. Majority (68.75%) of pediatric patients had a duration of fever of <24 h when the first episode of febrile seizure occurred. The maximum number (82.5%) of patients lacked a family history of febrile seizure, while 17.5% of patients had a positive family history of FS in the present study.

Upper airway infections were the most common triggering factors. 70% of the pediatric patients had upper respiratory tract infection, 11.25% had lower respiratory tract infection, 10% of patients had positive blood culture, 5% of the patients had acute gastroenteritis, and only 1.25% of patients had urinary tract infection, and malaria while cause cannot be determined in 1 patient. The maximum number of patients had simple febrile seizures, which are 81.25%, whereas 18.75% of patients had complex febrile seizures.

The majority (73.75%) of patients in the present study had anemia, while 26% of patients had normal hemoglobin levels. A total of 24 out of 80 patients (30%) had hyponatremia, while the rest had normal serum sodium levels, 56 out of 80 (70%). WBC count >11×109/L was found in 45 patients out of 80 (56.25%) and WBC count<4.5×109/L was found in 6 out of 80 (7.5%).

DISCUSSION

It is noticeable in the present study that the majority of patients, 77.5% (62 out of 80), belong to the age group between 1 and 3 years which is similar to the study of Amerendra *et al*. (1997) in which also the maximum number of the patient were in12–36 month [12].

As it was evident from the previous study done by Amerendra *et al*. (1997), Adhikari *et al*. (2007–2011), Shrestha *et al*. (2009–2013) [13], and Raju *et al*. (2017–2018) [14] all had more number of male patients similar to our study.

In a similar study done by Anderson *et al*. [15], in which 91/100 patients develop febrile seizures within 24 h of fever (short duration of fever), and 9/100 patients develop febrile seizures after 24 h (long duration of fever), in our study also 68.75% (55/80) patient had febrile seizures within 24 h of fever and 31.25% (25/80) had febrile seizures after 24 h of fever.

In our study majority of the patients, 82.5% (66/80), had no family history of febrile seizure, while 17.5% (14/80) patients had a family history of febrile seizure at the time of presentation, which is similar to the study done by Aliabad *et al*. [16] in which 31 (19.4%) of the patients had a positive family history of FS.

When the fisher exact test was applied for testing the association between a family history of febrile seizures and the occurrence of febrile seizures in pediatric patients it was found to be statistically significant with a $p<0.0001$, similar to the study of Raju *et al*. (2020) which also had a statistically significant correlation between family history of febrile seizures and occurrence of febrile seizures in children.

As it is evident from previous studies by Adhikari *et al*. (2013), in which 69% of patients had simple febrile seizures. Aliabad *et al*. (2013), in which 61.9% of patients had simple seizures 110 and Shrestha *et al*. (2014) in which 76.7% of patients had simple febrile seizures,109 which is similar to our study in which 81.25 %, that is the majority of the patient had simple febrile seizures.

In the present study 59 out of 80 (73.75%), patients had hemoglobin less than 11 mg/dl suggesting anemia. In the study of Jang *et al*. [17], iron deficiency was more prevalent in the febrile seizure group (49.2%) than in the control group (16.9%). These suggest that iron deficiency anemia may increase the risk of febrile seizures, similar to our study.

In the present study, Wbc count >11×109/L found in 45 patients out of 80 (56.25%), while less than 4.5×109/L was found in 6 (7.5%)

patients and the rest 29 (36.25 %) had normal leucocyte count similar to the study of Biyani *et al.* [18], in which when they compared Febrile convulsion (FC) and non-febrile convulsion children, they encountered a significant increase of WBC (p=0.0005) in children with FS, measured at the time of admission which is similar to the present study as 45/80 (56.25%) patients had increased WBC count.

CONCLUSION

Hence in conclusion, it can be said that as majority of patients with febrile seizures presented at a younger age which might represent the vulnerability of the developing brain to fever. As all the patients were discharged without any complication, so this study further adds to the knowledge of the benign nature of this disease.

AUTHORS' CONTRIBUTIONS

The manuscript writing had accomplished by Priyanishaben dhodi and the data collection and analysis were done by Priyanishaben dhodi. Research was reviewed and edited by Pushparaj Patil and statistical analysis was done by Zubair Khan. Manuscript finalized, edited, and submitted for publication by Pushparaj Patil.

AUTHORS' FUNDING

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors to carry out the work described in this study.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript.

REFERENCES

1. Byeon JH, Kim GH, Eun BL. Prevalence, incidence, and recurrence of febrile seizures in Korean children based on national registry data. J Clin Neurol 2018;14:43-7. doi: 10.3988/jcn.2018.14.1.43. PMID: 29629539; PMCID: PMC5765255
2. Freeman JM. Febrile seizures: A consensus of their significance, evaluation, and treatment. Pediatrics 1980;66:1009. PMID: 7454463
3. Chungath M, Shorvon S. The mortality and morbidity of febrile seizures. Nat Clin Pract Neurol 2008;4:610-21. doi: 10.1038/ncpneuro0922. PMID: 18978801
4. Guidelines for the management of convulsions with fever. Joint Working Group of the Research Unit of the Royal College of Physicians and the British Paediatric Association. BMJ 1991;303:634-6. doi: 10.1136/bmj.303.6803.634. PMID: 1932910; PMCID: PMC1671115
5. Singhi PD, Jayshree K. Febrile seizures: An update. Indian Pediatr 1995;32:564-72. PMID: 8613315
6. Berg AT, Shinnar S. Complex febrile seizures. Epilepsia 1996;37:126-33. doi: 10.1111/j.1528-1157.1996.tb00003.x. PMID: 8635422
7. Joshi C, Wawrykow T, Patrick J, Prasad A. Do clinical variables predict an abnormal EEG in patients with complex febrile seizures? Seizure 2005;14:429-34. doi: 10.1016/j.seizure.2005.07.006. PMID: 16099180
8. Mikati MA, Hani AJ. Febrile seizures. In: Nelson Text Book of Pediatrics. 20th ed. Philadelphia, PA: Elsevier; 2015. p. 2829-31.
9. Van Stuijvenberg M, de Vos S, Tjiang GC, Steyerberg EW, Derksen-Lubsen G, Moll HA. Parents' fear regarding fever and febrile seizures. Acta Paediatr 1999;88:618-22. doi: 10.1080/08035259950169260. PMID: 10419245
10. Kürügöl NZ, Tütüncüoglu S, Tekgül H. The family attitudes towards febrile convulsions. Indian J Pediatr 1995;62:69-75. doi: 10.1007/BF02752187. PMID: 10829846
11. Parmar RC, Sahu DR, Bavdekar SB. Knowledge, attitude and practices of parents of children with febrile convulsion. J Postgrad Med 2001;47:19-23. PMID: 11590285
12. Amrendra. Clinical study of febrile convulsion. Karnataka Ped J 1997;16:11-5.
13. Shrestha D, Dhakal AK, Shakya H, Shakya A, Shah SC, Mehata S. Clinical characteristics of children with febrile seizure. J Nepal Health Res Counc 2014;12:162-6. PMID: 26032052
14. Raju V, Parvathy M. Clinical profile of children with febrile seizure in a peripheral teaching hospital. Int J Contemp Pediatr 2020;7:631-4. https://dx.doi.org/10.18203/2349-3291.ijcp20200528
15. Anderson AB, Desisto MJ, Marshall PC, Dewitt TG. Duration of fever prior to onset of a simple febrile seizure: A predictor of significant illness and neurologic course. Pediatr Emerg Care 1989;5:12-5. doi: 10.1097/00006565-198903000-00004. PMID: 2710662
16. Aliabad GM, Khajeh A, Fayyazi A, Safdari L. Clinical, epidemiological and laboratory characteristics of patients with febrile convulsion. J Compr Ped 2013;3:134-7.
17. Jang HN, Yoon HS, Lee EH. Prospective case control study of iron deficiency and the risk of febrile seizures in children in South Korea. BMC Pediatr 2019;19:309. doi: 10.1186/s12887-019-1675-4. PMID: 31484495; PMCID: PMC6724315
18. Biyani G, Ray SK, Chatterjee K, Sen S, Mandal PK, Mukherjee M. Leukocyte count and C reactive protein as diagnostic factors in febrile convulsion. Asian J Med Sci 2017;8:56-8. https://doi.org/10.3126/ajms.v8i2.1633