



An Observational Study of Clinical Presentation and Treatment Outcome of Febrile Seizures in Children Attending a Teaching Hospital

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Abstract

Background: Febrile seizures are the most common seizure disorder in early childhood and usually occur between 6 months and 5 years of age. Although the prognosis is generally favorable, the initial event causes considerable parental anxiety and often leads to hospital attendance. **Objectives:** To describe the clinical presentation, etiological profile, management practices, and treatment outcomes of children presenting with febrile seizures to a teaching hospital. **Methods:** This hospital-based observational study was conducted in the Department of Pediatrics, Government Medical College, Nizamabad, Telangana, from February 2025 to January 2026. A total of 120 children aged 6 months to 5 years presenting with febrile seizures were included. Children with evidence of central nervous system infection, prior afebrile seizures, known epilepsy, metabolic seizures, or major neurodevelopmental disorders were excluded. Clinical details, seizure characteristics, source of fever, investigations, treatment, and in-hospital outcomes were recorded and analyzed descriptively. **Results:** The mean age was 22.8 ± 13.4 months, and 60.0% were male. Simple febrile seizures accounted for 70.0% of cases, while generalized tonic-clonic seizures were observed in 80.0%. Seizure duration was less than 5 minutes in 63.3% of children. Upper respiratory tract infection was the commonest febrile illness [38.3%]. Rescue anticonvulsant therapy was required in 23.3% of cases. Most children [96.7%] were discharged without neurological deficit, 5.0% required pediatric intensive care admission, and no mortality occurred. **Conclusion:** Febrile seizures in this cohort occurred predominantly in children below 2 years of age and were mainly simple, brief, and generalized in pattern. The overall hospital outcome was excellent, with low in-hospital recurrence, short duration of stay, and absence of mortality.

Keywords: febrile seizures; children; clinical presentation; treatment outcome; observational study; teaching hospital.



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INTRODUCTION

Febrile seizures are among the most frequent neurologic emergencies encountered in pediatric practice and represent the commonest seizure type in children younger than 5 years [1]. They are generally defined as seizures occurring in association with fever in children between 6 and 60 months of age, without evidence of central nervous system infection, prior unprovoked seizures, or an acute metabolic cause [2]. The overall reported incidence is approximately 2% to 5% in Western populations, with higher frequencies described in some Asian settings, including Indian children [3]. Peak occurrence is usually seen during the second year of life, and male predominance has been reported in many cohorts [3-5].

Clinically, febrile seizures are classified as simple or complex. A simple febrile seizure is generalized, lasts less than 15 minutes, and does not recur within 24 hours, whereas complex febrile seizures are prolonged, focal, or recurrent during the same febrile illness [4]. This distinction is important because it guides the extent of evaluation, decisions regarding observation, and counselling of caregivers [6,7]. Most simple febrile seizures are self-limited and do not require extensive laboratory testing, electroencephalography, or neuroimaging. Instead, current recommendations emphasize careful clinical assessment to identify the source of fever and to exclude meningitis or other serious intracranial pathology when clinically indicated [7].

Despite their usually benign nature, febrile seizures remain a major cause of parental distress, emergency visits, and pediatric admissions [7]. Recurrence occurs in nearly one-third of affected children, especially in those with younger age at onset, lower temperature at the time of seizure, shorter duration of fever before seizure, and a positive family history [8-10]. Long-term prognosis is favorable for the majority; however, complex features and repeated febrile seizures have been associated with a higher later risk of epilepsy in some cohort studies. Therefore, documenting the clinical spectrum and

immediate treatment outcomes of febrile seizures in real-world hospital settings remains relevant for improving early triage, avoiding unnecessary interventions, and strengthening family counselling.

Data from different regions show variability in the distribution of age, seizure type, underlying febrile illness, and patterns of investigation and hospitalization. Local observational data are particularly useful in Indian teaching hospitals, where infectious etiologies, referral patterns, and resource use often differ from those in guideline-forming settings. Against this background, the objectives of the present study were to describe the demographic and clinical profile of children presenting with febrile seizures, identify the common etiologies of fever, document treatment practices, and assess short-term hospital outcomes among children attending Government Medical College, Nizamabad, Telangana.

METHODOLOGY

Study design and setting:

This hospital-based observational study was conducted in the Department of Pediatrics, Government Medical College, Nizamabad, Telangana, over a 12-month period from February 2025 to January 2026. The study was designed to document the clinical profile, management pattern, and in-hospital outcomes of children presenting with febrile seizures in a teaching hospital setting.

Study population:

Children aged 6 months to 5 years who presented with fever-associated seizures during the study period were screened for eligibility. Febrile seizure was defined according to accepted pediatric criteria as a seizure occurring in association with fever, in the absence of central nervous system infection, acute metabolic derangement, or previous afebrile seizures [1-3]. Both first episodes and recurrent febrile seizures were included. Children with known epilepsy, evidence of meningitis or encephalitis, seizures attributable to electrolyte imbalance or hypoglycemia, major structural brain disease, or severe pre-existing neurodevelopmental disorders were excluded from the analysis.

Sample size and sampling:

A total of 120 eligible children were enrolled consecutively during the study period. Consecutive sampling was adopted to minimize selection bias and to reflect the actual case mix encountered in routine pediatric practice at the institution.

Data collection:

After initial stabilization, relevant information was obtained from parents or caregivers using a structured case-record form. Demographic details included age, sex, residence, past history of febrile seizures, and family history of febrile seizures. Clinical variables recorded at admission included temperature, seizure semiology, duration of seizure, number of seizure episodes within 24 hours, and associated symptoms such as postictal drowsiness, vomiting, irritability, or altered sensorium. The source of fever was determined on clinical grounds and with supportive investigations where required. Febrile seizures were categorized as simple or complex using standard operational definitions [1-4].

Management and outcome assessment:

All children received standard supportive care, including airway stabilization when necessary, temperature control, and treatment of the underlying febrile illness. Rescue anticonvulsant therapy was administered for active or prolonged seizures according to hospital practice and accepted pediatric recommendations [1,6,7]. Investigations such as lumbar puncture, electroencephalography, and neuroimaging were performed selectively on clinical indication rather than routinely. Outcome variables included recurrent seizure during hospitalization, requirement of pediatric intensive care unit admission, neurological status at discharge, mortality, and duration of hospital stay.

Statistical analysis and ethics:

Data were entered into a spreadsheet and analyzed using descriptive statistics. Continuous variables were summarized as mean $\pm$ standard deviation, while categorical variables were presented as frequency and percentage. Institutional Ethics Committee approval was obtained before the commencement of the study. Written informed consent was obtained from parents or legal guardians before inclusion of children in the study.

RESULTS

A total of 120 children presenting with febrile seizures were included in the study. The age of the participants ranged from 6 months to 5 years, with a mean age of 22.8 ± 13.4 months. The majority of children were in the 13-24 months age group [40.0%], followed by 6-12 months [21.7%], 25-36 months [20.0%], and 37-60 months [18.3%]. Male children were more commonly affected than females [60.0% vs 40.0%]. A past history of febrile seizures was present in 22 [18.3%] children, while 18 [15.0%] had a positive family history. Most children were from rural areas [56.7%] [Table 1].

Table 1. Baseline characteristics of study participants [n = 120]

Variable	Number	Percentage [%]
Age group [months/years]		
6-12 months	26	21.7
13-24 months	48	40.0
25-36 months	24	20.0
37-60 months	22	18.3
Sex		
Male	72	60.0
Female	48	40.0
Residence		
Rural	68	56.7
Urban	52	43.3
Past history of febrile seizure	22	18.3
Family history of febrile seizure	18	15.0

The clinical profile showed that the mean temperature at admission was $39.2 \pm 0.7^{\circ}\text{C}$. Most children had a temperature between 39.0°C and 39.9°C [51.7%]. Simple febrile seizures constituted the majority of cases [70.0%], while complex febrile seizures accounted for 30.0%. Generalized tonic-clonic seizures were the predominant seizure type [80.0%]. The seizure duration was less than 5 minutes in 63.3% of children, 5-15 minutes in 26.7%, and more than 15 minutes in 10.0%. A single seizure episode during the febrile illness was seen in 75.0% of cases, whereas recurrent seizures within 24 hours were recorded in 25.0% [Table 2].

Table 2. Clinical presentation and seizure characteristics [n = 120]

Variable	Number	Percentage [%]
Temperature at admission		
38.0-38.9°C	28	23.3
39.0-39.9°C	62	51.7
$\geq 40.0^{\circ}\text{C}$	30	25.0
Type of febrile seizure		
Simple febrile seizure	84	70.0
Complex febrile seizure	36	30.0
Seizure semiology		
Generalized tonic-clonic	96	80.0
Focal seizure	14	11.7
Tonic seizure	10	8.3
Duration of seizure		
<5 minutes	76	63.3
5-15 minutes	32	26.7
>15 minutes	12	10.0
Number of seizures within 24 hours		
Single episode	90	75.0
Recurrent episodes	30	25.0
Associated clinical features		
Postictal drowsiness	54	45.0
Irritability	38	31.7
Vomiting	26	21.7
Altered sensorium	12	10.0

Regarding the etiology of fever, upper respiratory tract infection was the most common underlying cause, accounting for 46 [38.3%] cases. This was followed by acute gastroenteritis in 22 [18.3%], lower respiratory tract infection in 18 [15.0%], otitis media in 14 [11.7%], urinary tract infection in 10 [8.3%], viral fever without localizing focus in 8 [6.7%], and other causes in 2 [1.7%] [Table 3].

Table 3. Etiology of fever among children with febrile seizures [n = 120]

Cause of fever	Number	Percentage [%]
Upper respiratory tract infection	46	38.3
Acute gastroenteritis	22	18.3
Lower respiratory tract infection	18	15.0
Otitis media	14	11.7
Urinary tract infection	10	8.3
Viral fever without focus	8	6.7
Others	2	1.7

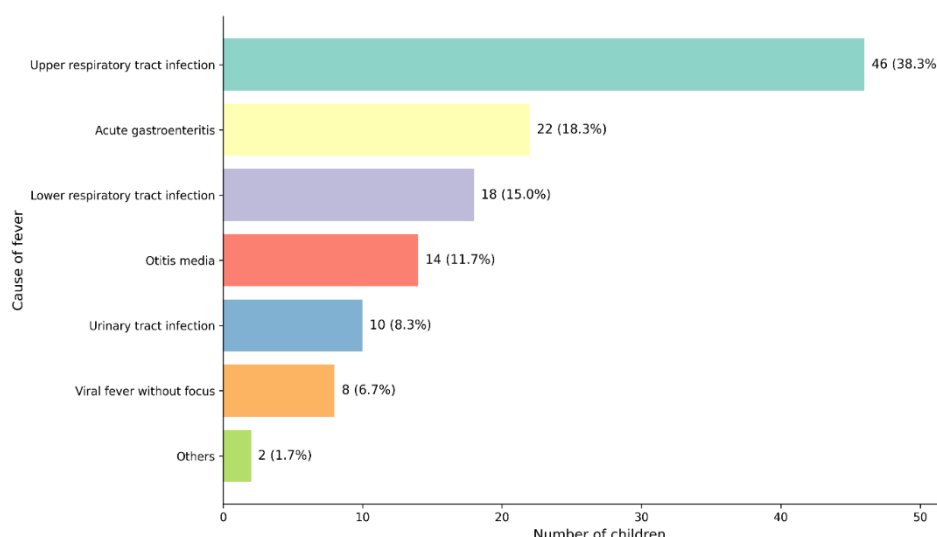


Figure1: Etiology of fever among children with febrile seizures

All children received antipyretics and supportive management. Rescue anticonvulsant therapy for active or prolonged seizures was required in 28 [23.3%] children. Intravenous fluids were administered in 34 [28.3%] cases, and antibiotics were used in 42 [35.0%] children according to the underlying illness. Lumbar puncture, electroencephalography, and neuroimaging were performed selectively in 14 [11.7%], 12 [10.0%], and 8 [6.7%] children, respectively. The treatment outcome was favorable in most patients. A total of 116 [96.7%] children were discharged without neurological deficit. Recurrent seizures during hospitalization occurred in 8 [6.7%] children, and 6 [5.0%] required pediatric intensive care unit admission. Most children stayed in hospital for 1-3 days [58.3%], while no mortality was observed in the study [Table 4].

Table 4. Treatment details and outcomes of study participants [n = 120]

Variable	Number	Percentage [%]
Treatment/interventions		
Antipyretics and supportive care	120	100.0
Rescue anticonvulsant therapy	28	23.3
Intravenous fluids	34	28.3
Antibiotics	42	35.0
Lumbar puncture performed	14	11.7
EEG performed	12	10.0
Neuroimaging performed	8	6.7
Outcomes		
Discharged without neurological deficit	116	96.7
Recurrent seizures during hospitalization	8	6.7
PICU admission	6	5.0
Left against medical advice	2	1.7
Mortality	0	0.0
Duration of hospital stay		
<24 hours	38	31.7
1-3 days	70	58.3
>3 days	12	10.0

Overall, febrile seizures were more common in children below 2 years of age and were predominantly simple in nature. Generalized tonic-clonic seizures and short-duration episodes formed the major clinical pattern. Upper respiratory tract infection was the leading precipitating illness. The overall outcome was excellent, with most children recovering without neurological sequelae and no deaths recorded.

DISCUSSION

The present study showed that febrile seizures occurred predominantly in children below 2 years of age, with a mean age of 22.8 months and a peak frequency in the 13-24 month group. This age clustering is consistent with the recognized biologic susceptibility of the developing brain during infancy and early toddlerhood, and it corresponds closely with prior reviews and cohort data showing a peak incidence between 12 and 18 months [5,8]. The observed male predominance also parallels earlier reports, including hospital-based series and broader epidemiologic reviews [14].

Simple febrile seizures formed the majority of cases in this cohort, and generalized tonic-clonic semiology was the predominant presentation. Most seizure episodes were brief and lasted less than 5 minutes. These findings are in line with established literature indicating that most febrile seizures are simple, generalized, and self-limited [7]. The relatively smaller proportion of complex febrile seizures remains clinically important because prolonged, focal, or recurrent episodes warrant closer observation and more selective investigations [6,7]. The present data therefore support a pragmatic distinction between simple and complex presentations in everyday pediatric practice.

Upper respiratory tract infection emerged as the leading source of fever, followed by acute gastroenteritis and lower respiratory tract infection. This pattern is biologically plausible because common viral febrile illnesses are known triggers of febrile seizures [7]. A past history of febrile seizures and positive family history were seen in a subset of children, which is noteworthy because recurrence studies have consistently identified younger age, family history, lower temperature at seizure onset, and shorter fever duration before seizure as important predictors of repeat events [8-10]. Although long-term follow-up was beyond the scope of the present work, the in-hospital recurrence rate remained low.

Management patterns in this study were also broadly concordant with contemporary recommendations. All children received supportive care, while rescue anticonvulsant therapy was reserved for active or prolonged seizures. Investigations such as lumbar puncture, EEG, and neuroimaging were performed selectively rather than routinely, reflecting current evidence that extensive neurodiagnostic testing is unnecessary in most children with simple febrile seizures unless clinical evaluation raises concern for central nervous system infection or another alternative diagnosis. The overall short-term outcome was excellent, with nearly all children discharged without neurological deficit, brief hospital stay in most cases, and no mortality. This favorable outcome agrees with previous hospital series and long-term cohort studies showing that most febrile seizures are benign, though recurrent or complex episodes carry a modestly increased later risk of epilepsy [11-14].

Limitations

This study was conducted at a single teaching hospital and assessed only in-hospital outcomes, which limits external validity and prevents evaluation of long-term recurrence or later epilepsy. The sample represented children who attended or were admitted to the institution and did not capture community cases managed at home or in peripheral centers. Detailed etiological confirmation was not available for every febrile illness.

CONCLUSION

Febrile seizures in children attending this teaching hospital were seen mainly in those younger than 2 years and were usually simple, generalized, and brief. Upper respiratory tract infection was the most frequent precipitating illness. Selective use of investigations, prompt supportive care, and rescue anticonvulsants for prolonged events were associated with excellent short-term outcomes. Most children recovered completely, the duration of hospitalization was short, and no deaths occurred. These findings reinforce the benign nature of febrile seizures while underscoring the importance of careful clinical evaluation to identify the source of fever, distinguish simple from complex events, avoid unnecessary investigations, and provide clear counselling to families regarding prognosis and need for follow-up.

REFERENCES

- [1]. Steering Committee on Quality Improvement and Management, Subcommittee on Febrile Seizures, American Academy of Pediatrics. Febrile seizures: clinical practice guideline for the long-term management of the child with simple febrile seizures. *Pediatrics*. 2008;121(6):1281-6. doi:10.1542/peds.2008-0939.
- [2]. Subcommittee on Febrile Seizures; American Academy of Pediatrics. Neurodiagnostic evaluation of the child with a simple febrile seizure. *Pediatrics*. 2011;127(2):389-94. doi:10.1542/peds.2010-3318.
- [3]. Fetveit A. Assessment of febrile seizures in children. *Eur J Pediatr*. 2008;167(1):17-27. doi:10.1007/s00431-007-0577-x.

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- [4]. Patterson JL, Carapetian SA, Hageman JR, Kelley KR. Febrile seizures. *Pediatr Ann.* 2013;42(12):249-54. doi:10.3928/00904481-20131122-09.
- [5]. Leung AKC, Hon KL, Leung TNH. Febrile seizures: an overview. *Drugs Context.* 2018;7:212536. doi:10.7573/dic.212536.
- [6]. Mittal R. Recent advances in febrile seizures. *Indian J Pediatr.* 2014;81(9):909-16. doi:10.1007/s12098-014-1532-2.
- [7]. Ferretti A, Riva A, Fabrizio A, Bruni O, Capovilla G, Foiadelli T, et al. Best practices for the management of febrile seizures in children. *Ital J Pediatr.* 2024;50(1):95. doi:10.1186/s13052-024-01666-1.
- [8]. Kumar N, Midha T, Rao YK. Risk factors of recurrence of febrile seizures in children in a tertiary care hospital in Kanpur: a one year follow up study. *Ann Indian Acad Neurol.* 2019;22(1):31-36. doi:10.4103/aian.AIAN_472_17.
- [9]. Berg AT, Shinnar S, Hauser WA, Alemany M, Shapiro ED, Salomon ME, et al. A prospective study of recurrent febrile seizures. *N Engl J Med.* 1992;327(16):1122-7. doi:10.1056/NEJM199210153271603.
- [10]. Offringa M, Derksen-Lubsen G, Bossuyt PM, Lubsen J. Seizure recurrence after a first febrile seizure: a multivariate approach. *Dev Med Child Neurol.* 1992;34(1):15-24. doi:10.1111/j.1469-8749.1992.tb08559.x.
- [11]. Verity CM, Golding J. Risk of epilepsy after febrile convulsions: a national cohort study. *BMJ.* 1991;303(6814):1373-6. doi:10.1136/bmj.303.6814.1373.
- [12]. Neligan A, Bell GS, Giavasi C, Johnson AL, Goodridge DM, Shorvon SD, et al. Long-term risk of developing epilepsy after febrile seizures: a prospective cohort study. *Neurology.* 2012;78(15):1166-70. doi:10.1212/WNL.0b013e31824f807a.
- [13]. Dreier JW, Li J, Sun Y, Christensen J. Evaluation of long-term risk of epilepsy, psychiatric disorders, and mortality among children with recurrent febrile seizures: a national cohort study in Denmark. *JAMA Pediatr.* 2019;173(12):1164-70. doi:10.1001/jamapediatrics.2019.3343.
- [14.] Al-Khathlan NA, Jan MM. Clinical profile of admitted children with febrile seizures. *Neurosciences (Riyadh).* 2005;10(1):30-3.