

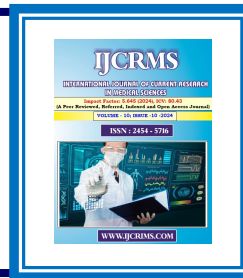


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An observational study of prevalence and risk factors of febrile seizures in pediatrics and drug utilisation review

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Abstract

Introduction: Febrile seizures (FS) are common in pediatric populations, often causing significant concern for families. This study aimed to assess the prevalence, risk factors, and drug utilization patterns in children with febrile seizures.

Methods: A cross-sectional observational study was conducted on 300 pediatric patients aged 6 months to 6 years, with 80 diagnosed with febrile seizures. Data were collected on demographics, seizure characteristics, fever patterns, and treatment modalities, including antipyretics and antiepileptic drugs.

Results: There were 300 individuals admitted to the pediatrics department overall for this investigation. 80 out of the 300 individuals diagnosed with febrile seizures. This study indicates that prevalence of febrile seizures is 26.67%. Among the 80 patients, 56.3% were aged 1-3 years, with a male predominance of 57.5%. Upper respiratory infections triggered 56.3% of the seizures. Simple febrile seizures accounted for 75% of cases, while 22.5% experienced recurrence. Antipyretics were used in 81.3% of cases, and antibiotics were prescribed to 87.5%. Hospitalization was required in 15% of patients, with a low complication rate of 6.3%.

Conclusion: The study highlights the commonality of febrile seizures in young children, with URIs as significant triggers. Most cases are self-limiting, with minimal complications, underscoring the importance of effective fever management and education for caregivers.

Keywords: Febrile seizures, Pediatrics, Risk factors, Drug utilization.

Introduction

Febrile seizures (FS) are a prevalent form of seizure disorder observed in pediatric populations, affecting approximately 2-5% of children between the ages of 6 months and 5 years. These seizures are characterized by convulsions triggered by fever, typically resulting from a viral or bacterial infection. Febrile seizures can evoke considerable concern among parents and caregivers due to their dramatic presentation and potential association with underlying health issues. Although most cases of febrile seizures are benign and self-limiting, they remain a significant cause of emergency department visits in young children. The clinical presentation of febrile seizures can vary, with simple febrile seizures being generalized, lasting less than 15 minutes, and not recurring within a 24-hour period. Conversely, complex febrile seizures may be focal, last longer than 15 minutes, or recur during the same illness. Understanding the clinical characteristics and epidemiology of febrile seizures is essential for healthcare professionals to provide effective management and reassurance to families.^[1,2]

The pathophysiology of febrile seizures is not entirely understood, but several factors are believed to contribute to their occurrence. One prevailing hypothesis is that the rapid increase in

body temperature, rather than the fever itself, triggers the seizures, especially in genetically predisposed children. Moreover, children with a family history of seizures are at higher risk, suggesting a possible genetic component. Various infectious agents, particularly viral infections, are the most common triggers for febrile seizures. This association underscores the importance of recognizing febrile seizures as a symptom rather than an isolated condition, linking them to broader infectious diseases that may be affecting the child.^[3,4,5]

The incidence of febrile seizures varies across populations, with higher rates observed in males compared to females. Epidemiological studies indicate that urban children may have an increased risk of febrile seizures due to higher exposure to infectious agents. Despite the high prevalence of febrile seizures, there is a lack of awareness among parents and caregivers regarding their benign nature and management strategies. Consequently, education and counseling are crucial in alleviating parental anxiety and ensuring appropriate care for affected children.^[6,7]

The need for this study arises from the widespread prevalence of febrile seizures in the pediatric population and the accompanying

misconceptions that can lead to unnecessary anxiety and medical interventions. Understanding the prevalence, risk factors, and drug utilization patterns associated with febrile seizures can significantly impact clinical practice and patient outcomes. Despite their benign nature, febrile seizures are often treated with extensive diagnostic testing and unnecessary treatments due to parental concerns and misinterpretations of the condition's severity. By conducting an observational study focusing on the prevalence and risk factors of febrile seizures, this research aims to provide valuable data that can guide healthcare professionals in managing these events more effectively.^{18,9,10]}

Aim

To investigate the prevalence, risk factors, and drug utilization patterns associated with febrile seizures in pediatric patients.

Objectives:

1. To determine the prevalence of febrile seizures among pediatric patients presenting with fever
2. To identify the risk factors associated with the occurrence of febrile seizures.
3. To evaluate the patterns of drug utilization in the management of febrile seizures.

Methodology

Study Site: This study was conducted in a tertiary care hospital

Study Duration: The study is conducted over a period of 6 months.

Study Design: This is an observational study

Sample Size: 80 patients were enrolled into this study based on febrile seizure diagnosis

Study method: This observational cross-sectional study was conducted on 300 pediatric patients aged 6 months to 6 years, of which 80 experienced febrile seizures. Patients were

recruited from a tertiary care hospital, and those with neurological disorders or unprovoked seizures were excluded. Data on demographics, seizure characteristics, fever patterns, family history, and underlying infections were collected using a structured questionnaire. Treatment information, including the use of antipyretics, antiepileptics, and antibiotics, was reviewed. Outcomes such as seizure recurrence, hospitalization, and treatment efficacy were analyzed using descriptive statistics to assess prevalence, risk factors, and drug utilization patterns.

Study Criteria

Inclusion Criteria:

1. Pediatric patients aged between 6 months and 6 years.
2. Children diagnosed with febrile seizures associated with fever $\geq 38^{\circ}\text{C}$.
3. Patients with complete medical records available for review, including fever and seizure details.

Exclusion Criteria:

4. Children with pre-existing neurological disorders (e.g., epilepsy or cerebral palsy).
5. Patients with unprovoked seizures or central nervous system infections.
6. Incomplete or missing medical records related to fever or seizure events.

Statistical Analysis

Statistical analysis involved descriptive statistics, with frequencies, percentages etc and results are represented in tables.

Results

Prevalence calculation

Prevalence is calculated as the number of patients with stroke during the time of study divided by total number of patients admitted in neurology department during the time.

There were 300 individuals admitted to the pediatrics department overall for this investigation. 80 out of the 300 individuals

diagnosed with febrile seizures. This study indicates that prevalence of febrile seizures is 26.67%.

1. Demographic Characteristics of Pediatric Patients with Febrile Seizures

| Variable | Frequency (n) | Percentage (%) |
|-----------------------------------|---------------|----------------|
| Age | | |
| < 1 year | 10 | 12.50% |
| 1-3 years | 45 | 56.30% |
| 4-6 years | 18 | 22.50% |
| > 6 years | 7 | 8.80% |
| Gender | | |
| Male | 46 | 57.50% |
| Female | 34 | 42.50% |
| Area of Residence | | |
| Urban | 50 | 62.50% |
| Rural | 30 | 37.50% |
| Family History of Seizures | | |
| Positive | 22 | 27.50% |
| Negative | 58 | 72.50% |

This table provides a demographic breakdown of the 80 pediatric patients with febrile seizures. Most patients (56.3%) were between 1-3 years of age, with males representing a slightly higher

proportion (57.5%) than females. Urban residents accounted for 62.5% of the sample, and 27.5% had a positive family history of seizures.

2. Risk Factors Associated with Febrile Seizures in Pediatric Patients

| Risk Factor | Frequency (n) | Percentage (%) |
|---|---------------|----------------|
| Fever Duration | | |
| < 24 hours | 35 | 43.80% |
| 24-48 hours | 32 | 40% |
| > 48 hours | 13 | 16.30% |
| Peak Fever Temperature | | |
| < 38°C | 6 | 7.50% |
| 38°C - 39°C | 46 | 57.50% |
| > 39°C | 28 | 35% |
| Previous Febrile Seizure History | | |
| Yes | 26 | 32.50% |
| No | 54 | 67.50% |
| Duration of Seizure | | |
| < 5 minutes | 50 | 62.50% |
| 5-10 minutes | 20 | 25% |
| > 10 minutes | 10 | 12.50% |

This table outlines the risk factors commonly associated with febrile seizures among the pediatric population. The majority of patients (43.8%) experienced fever for less than 24 hours before the onset of seizures. Peak fever

temperature between 38°C and 39°C was the most common (57.5%). Furthermore, 32.5% of patients had a history of previous febrile seizures, and the seizures lasted less than 5 minutes in 62.5% of cases.

3. Distribution of Seizure Types and Triggering Infections in Pediatric Patients with Febrile Seizures

| Variable | Frequency (n) | Percentage (%) |
|--|---------------|----------------|
| Type of Seizure | | |
| Simple Febrile Seizure | 60 | 75% |
| Complex Febrile Seizure | 20 | 25% |
| Triggering Infections | | |
| Upper Respiratory Tract Infection (URTI) | 45 | 56.30% |
| Gastrointestinal Infection | 20 | 25% |
| Otitis Media | 10 | 12.50% |
| Others (e.g., UTI) | 5 | 6.30% |

This table highlights the type of febrile seizures and their common triggers. Simple febrile seizures were more frequent (75%) than complex febrile seizures. The most common triggering

infection was upper respiratory tract infections (56.3%), followed by gastrointestinal infections (25%).

4. Drug Utilization Patterns in Pediatric Patients with Febrile Seizures

| Drug Category | Frequency (n) | Percentage (%) |
|----------------------------|---------------|----------------|
| Antipyretics | | |
| Paracetamol | 65 | 81.30% |
| Ibuprofen | 15 | 18.70% |
| Antiepileptic Drugs | | |
| Diazepam | 30 | 37.50% |
| Lorazepam | 10 | 12.50% |
| Phenobarbital | 5 | 6.30% |
| Antibiotics | | |
| Amoxicillin | 40 | 50% |
| Azithromycin | 20 | 25% |
| Cefixime | 10 | 12.50% |
| No Antibiotics | 10 | 12.50% |

This table describes the drug utilization patterns among pediatric patients with febrile seizures. Antipyretics were the most commonly prescribed drugs, with paracetamol being used by 81.3% of the patients. Antiepileptic drugs like diazepam

were prescribed to 37.5% of patients to manage seizures. Antibiotics, especially amoxicillin, were used in 50% of cases, mostly to treat underlying infections that triggered the febrile seizures.

5. Outcomes and Recurrence Rates of Febrile Seizures in Pediatric Patients

| Outcome | Frequency (n) | Percentage (%) |
|---------------------------------|---------------|----------------|
| Seizure Recurrence | | |
| Yes | 18 | 22.50% |
| No | 62 | 77.50% |
| Hospitalization Required | | |
| Yes | 12 | 15% |
| No | 68 | 85% |
| Seizure Complications | | |
| Yes | 5 | 6.30% |
| No | 75 | 93.70% |

This table reports the outcomes of febrile seizures in pediatric patients. Seizure recurrence occurred in 22.5% of patients during the follow-up period. Hospitalization was required in 15% of cases, while seizure complications were rare, occurring in only 6.3% of patients.

Discussion

This observational study provides an in-depth analysis of febrile seizures in pediatric patients, highlighting key epidemiological trends. The highest prevalence was observed among children aged 1-3 years, aligning with known susceptibility due to neurological immaturity. Males constituted a slightly higher percentage of cases (57.5%), consistent with the minor male predominance reported in similar studies. Urban patients were overrepresented, accounting for 62.5% of the cases, which may reflect differences in healthcare access or environmental factors. Family history emerged as a significant risk factor, with 27.5% of children having a familial link to seizures, reinforcing the role of genetic predisposition in febrile seizure development. Additionally, febrile seizures most frequently occurred within 24 hours of fever onset, emphasizing the critical role of rapid temperature changes rather than sustained high fever.

Seizure classification in this study revealed that 75% of febrile seizures were simple, characterized by their brief, generalized nature and favorable prognosis. Complex febrile seizures, which are longer or focal in nature, constituted 25% of cases and are associated with higher risks of future complications, such as epilepsy. Upper respiratory

tract infections (URTIs) were the leading cause of fever (56.3%), followed by gastrointestinal infections (25%) and otitis media (12.5%). This finding underscores the importance of timely diagnosis and treatment of common infections in pediatric patients, as they represent a major trigger for febrile seizures. Addressing these infections early can help prevent seizure episodes and minimize the associated risks of complex febrile seizures.

Antipyretic use was extensive in this cohort, with paracetamol (81.3%) and ibuprofen (18.7%) being the primary treatments to manage fever and reduce seizure risk. The widespread use of these medications reflects their efficacy in controlling fever, a critical component in febrile seizure management. Antiepileptic drugs (AEDs) like diazepam were prescribed in 37.5% of cases, particularly in managing prolonged seizures. The relatively low need for AEDs aligns with the fact that most febrile seizures are self-limiting. Antibiotics were used in 87.5% of cases, reflecting the prevalence of bacterial infections as triggers for febrile illnesses. Seizure recurrence was observed in 22.5% of cases, which is within the expected range, and only 15% required hospitalization, highlighting the generally benign nature of febrile seizures. The overall prognosis remains positive, with minimal complications and favorable outcomes in the majority of cases.

Conclusion

This observational study revealed key findings about the prevalence, risk factors, and drug utilization patterns in pediatric patients with

febrile seizures. The majority of the patients were between 1-3 years of age, with simple febrile seizures being more common than complex ones. The most frequent triggering infection was upper respiratory tract infection. Paracetamol was the most widely used antipyretic, and diazepam was the primary antiepileptic drug used. Despite the high frequency of febrile seizures, complications were rare, and recurrence rates were relatively low. However, febrile seizures remain a significant concern for pediatric healthcare, especially in managing risk factors such as fever duration, peak temperature, and underlying infections. These findings can inform clinical practice and guide the management of febrile seizures, including the appropriate use of antipyretics, antiepileptic drugs, and antibiotics.

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