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EPIDEMIOLOGICAL PROFILE OF CHILDREN WITH FEBRILE SEIZURES IN A PRIVATE HOSPITAL IN SOUTHERN SANTA CATARINA

João Pedro Viapiana Paviani

Medical School, Universidade do Extremo
Sul Catarinense

Leonardo Pizzolotto Ferreira

Medicine Course, Universidade do Extremo
Sul Catarinense

Giselle Guarezi Martins

Medicine Course, Universidade do Extremo
Sul Catarinense

Vito Longaretti Miraglia

Medical School, Universidade do Extremo
Sul Catarinense

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Abstract: A febrile seizure can be defined as a convulsive episode triggered by a febrile condition, which occurs in children aged between 6 months and 6 years, excluding other conditions. The aim of this study was to evaluate the clinical and epidemiological profile of children admitted with febrile seizures to a hospital in the municipality of Criciúma/SC. This is a retrospective cross-sectional study of 86 patients aged between 6 months and 6 years admitted with febrile seizures, using data collected from electronic medical records between 2021 and 2023. In the sociodemographic variables analyzed, it was possible to verify that the average age of the individuals was 25.78 ± 14.49 months, with 58.1% of the individuals being male. As for the clinical variables, 73.3% of the individuals were admitted after a febrile seizure, 64% of whom did not have a post-ictal state. Simple seizures accounted for 77.9% of cases and complex seizures for 22.1%. With regard to etiology, 58.1% were infectious, 3.5% were caused by vaccination and 38.4% by other causes. The average temperature on admission was $37.93 \pm 0.95^{\circ}\text{C}$, with an average duration of 4 minutes (0 - 30min). It can therefore be concluded that the study's findings can be beneficial both for health professionals, as they ensure more knowledge of the disease in the local context, and for the patients' families, since in most cases it is a benign and self-limiting clinical profile, which can alleviate concerns about the condition.

Keywords: Fever; Convulsions; Pediatrics; Epidemiology.

A febrile seizure can be defined as a convulsive episode triggered by a febrile condition that occurs in children aged 6 months to 6 years, excluding intracranial infections, hypoglycemia, acute hydroelectrolytic imbalance and previous afebrile seizures¹. Seizures can be classified as simple, when they last less than 15 minutes, do not recur within 24 hours

and resolve spontaneously; or as complex, which last longer than 15 minutes, present focal symptoms at the beginning or during the seizure and can recur within 24 hours or within the same febrile illness². Simple seizures are more common, with an estimated prevalence of 70-80%, and complex seizures between 20-30%³.

In the majority of cases, it is characterized as a benign and self-limiting condition, but in 30-40% of cases there may be a recurrence of the seizure, especially if the type of seizure is complex, where there is a greater risk of subsequent epilepsy⁴. Among children under 5 years old, it is estimated that 2-5% of them will have at least one episode of seizure in their lifetime, with a peak incidence at 24 months of age, making it the most common cause of seizures in childhood³.

In terms of causes, febrile seizures have a diverse etiology, involving viral diseases and vaccines, as well as risk factors such as intrauterine exposure to smoking and maternal stress and admission to an intensive care unit for more than 28 days². In addition, genetic predisposition is an important etiological factor, with up to 20-40% of children with febrile seizures having a positive family history of febrile seizures or epilepsy⁵. Familial genetic syndromes, such as GEFS+ (genetic epilepsy with febrile seizures plus), are also causes of the disease and are related to greater recurrence of febrile seizure episodes⁶.

The clinical presentation of the disease is a generalized tonic-clonic seizure in the simple type and with hemilateral or focal involvement in the complex type, in which case it can be accompanied by a persistent post-ictal event, such as Todd's palsy³. Due to the fact that it presents as a seizure, it is an illness that usually causes excessive worry and anxiety for parents, requiring an appropriate medical approach, informing them of the benign nature of simple seizures².

In pediatric emergencies, febrile seizures are one of the main causes of pediatric emergency room visits. In view of this, further studies are needed to gain a better understanding of the disease, generating knowledge for health professionals and the community. Therefore, the aim of this study was to analyze the clinical and epidemiological characteristics of febrile seizures in children admitted to the emergency department.

DEVELOPMENT

Ethical aspects: This study was approved by the Human Research Ethics Committee of the Universidade do Extremo Sul Catarinense under opinion 6.582.010.

Experimental design: Descriptive observational study, with secondary data collection and a quantitative approach.

Population: A total of 86 patients were evaluated, seen between January 1, 2021 and December 31, 2023, aged between 6 months and 6 years, admitted to the emergency department of a private hospital in the extreme south of Santa Catarina with a febrile crisis.

Data collection: Patients were assessed by analyzing their medical records, from which the following information was taken: gender (male or female), age (in months), admission status (in crisis or post-crisis), post-ictal status (yes or no), type of crisis (simple or complex), temperature on admission (in C°), duration of the crisis (in minutes) and etiology of the crisis (infection, vaccine or other).

Data analysis: The data was collected and organized in spreadsheets, for later analysis, in SPSS software version 23.0.

A descriptive analysis of the variables studied was carried out, reporting the frequency and percentage of the qualitative variables (gender, state on admission to the emergency department, presence of post-ictal state, type of crisis and etiology of the crises) and the mean and standard deviation of the quantita-

tive variables (age, temperature on admission and duration of the crises).

All the results were expressed in graphs and/or tables. Inferential analyses were carried out with a significance level of $\alpha = 0.05$ and a 95% confidence interval. The distribution of quantitative variables was investigated for normality using the Kolmogorov-Smirnov test.

	Mean \pm SD, n (%) n = 86
Age (months)	25,78 \pm 14,49
Sex	
Male	50 (58,1)
Female	36 (41,9)
Admission status	
Febrile crisis	23 (26,7)
Post-crisis	63 (73,3)
Post-ictal	
Yes	31 (36,0)
No	55 (64,0)
Type of crisis	
Focal	67 (77,9)
Complex	19 (22,1)
Intake temperature (°C)	37,93 \pm 0,95
Duration of the crisis (min.)	4 (0 - 30)
Etiology Crisis	
Vaccine	3 (3,5)
Infection	50 (58,1)
Others	33 (38,4)

Table 1. Clinical and epidemiological profile of children with febrile seizures admitted to a private hospital in the south of Santa Catarina.

Source: survey data, 2024.

MATERIALS AND METHODS

The data collected was analyzed using IBM *Statistical Package for the Social Sciences* (SPSS) *software* version 23.0. Quantitative variables were expressed as means and standard deviations. Qualitative variables were expressed as frequency and percentage.

RESULTS

Table 1 shows the clinical and epidemiological profile of children with febrile seizures admitted to the emergency department of a private hospital in the south of Santa Catarina. In the sociodemographic variables analyzed, it was possible to see that the average age of the individuals was 25.78 ± 14.49 months, with 58.1% of the individuals being male. As for the clinical variables, 73.3% of the individuals were admitted after a febrile seizure, 64% of whom did not have a post-ictal state. Simple seizures accounted for 77.9% of cases and complex seizures for 22.1%. In terms of etiology, 58.1% were infectious, 3.5% were caused by vaccination and 38.4% by other causes. The average temperature on admission was $37.93 \pm 0.95^{\circ}\text{C}$, with an average duration of 4 minutes (0 - 30min.).

DISCUSSION

This study analyzed the clinical and epidemiological variables involved in patients with febrile seizures in the emergency department of a private hospital. According to Mikkonen⁷, the epidemiological profile of febrile seizures has a peak incidence of 12 to 18 months, with an average of 16 months, which differs from the data in this study, which obtained an average of 25 months. This variation may have occurred due to the specificity of the study in just one emergency room. In addition, the data obtained in the study carried out in the city of Barra de Bugres/MT⁸ showed an incidence of 50% in each sex. According to the research data, males had a slightly higher in-

cidence, which can also be explained by the specific location of the study's data collection.

Febrile seizures can be divided into simple and complex, usually with convulsions as the first sign of the disease⁷. According to Tiwari³, simple seizures are the most prevalent, and this was also found during the study, where simple seizures accounted for 77.9% of cases. According to Reese⁹, complex seizures can have a variable prevalence, between 10-35%, which is in line with the study, which showed 22.1%. The research data showed that the average duration was 4 minutes, which was also observed by Sfaihi¹⁰, who found that the average duration of febrile seizures is around 4 to 8 minutes. According to the same author, the average temperature was 39.4°C , which is higher than the 37.93°C found in our study. This may be explained by the fact that the most prevalent profile is that of a simple crisis, which is self-limiting and short-lived. In this case, children are taken to the emergency department after a seizure caused by a high fever has occurred, at which point the temperature is already lower than expected to start the condition.

As the most prevalent profile of febrile seizures is the simple type, which is self-limiting, it rarely presents as an active seizure episode in the emergency department.¹ According to the survey data, 73.3% of individuals were admitted after a febrile seizure, of which 64% did not present with a post-ictal state, such as drowsiness, headache and mental confusion after a febrile seizure. This may be explained by the fact that the most common febrile seizure lasts an average of 4 minutes, associated with the fact that it is of the simple type, which consequently makes the post-ictal state less prevalent, since it occurs more frequently in complex seizures.

The etiology of febrile seizures is multifactorial, involving infectious diseases, vaccine causes and genetic factors. In this case, 20 to

40% of children have a positive family history of febrile seizures or epilepsy². The survey data revealed that the majority of cases were from infectious causes, accounting for 58.1%, which is attributed especially to upper airway infections, otitis, urinary tract infection and pneumonia. According to Umesh Babu Kuruva¹¹, infectious causes represent the majority of etiologies, therefore, they converge with the present research. Approximately 40% of cases had other causes, in which genetic causes stand out, in which there is generally a positive family history of febrile crisis, especially in first-degree relatives. Finally, 3.5% of patients had vaccination causes that triggered the febrile crisis, which, according to Belosuva¹², occur after the administration of some specific vaccines, including diphtheria-tetanus-pertussis, the pneumococcal conjugate vaccine and inactivated influenza vaccines.

CONCLUSION

This study allowed us to analyze the clinical and epidemiological profile of children with febrile seizures in a large private hospital in the city of Criciúma/SC. It was possible to see that the patients analyzed were predominantly male, admitted in the post-seizure period and without a post-ictal state. The most common etiology was infectious, with the simple type being the most prevalent.

It is important to understand the profile of the disease in order to better care for and manage these patients. In addition, it is very useful in terms of reassuring those responsible, as this is a disease with an often worrying presentation but which, as analyzed in this study and in the literature, has a benign and self-limiting course in most cases.

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