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NON-EPILEPTIC EVENTS IN CHILDREN: VIDEO- -ELECTROENCEPHALO- GRAPHIC DIAGNOSIS AND CLINICAL-PSY- CHIATRIC CORRELA- TIONS

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Abstract: Introduction: Non-epileptic psychogenic events (NEPE) are a conversion disorder that present as paroxysmal episodes. They are present in 25 to 30% of patients with refractory epilepsy in tertiary epilepsy centers. There is still limited literature on the subject in children, which makes it difficult to approach it clinically and treat it, and can perpetuate related environmental stressors and iatrogenic measures, worsening the prognosis. Therefore, this study sought to better understand this pathology through video-electroencephalographic analysis of children diagnosed with ENEP and clinical-psychiatric correlations, in order to offer a better approach to patients. **Methodology:** A cross-sectional study was carried out by collecting data the medical records of patients who underwent video EEG at Hospital de Base de São José do Rio Preto between January 2015 and February 2021, aged between 5 and 14 years old, with a survey of the clinical-psychiatric and electroencephalographic aspects of these patients. **Results:** An incidence of 1.5% was found, with a predominance of females (59.25%) and children over the age of 10 (66.6%). An association between ENEP and epilepsy was found in 22.2% of patients. Of the patients with recorded psychiatric data, 55% had associated psychiatric comorbidities. The provocative test during videoencephalography was necessary for diagnosis in 37% of cases. **Conclusion:** There is a predominance of ENEP in older children and females and a significant association with epilepsy and psychiatric comorbidities. Provocative testing during the examination is important for more accurate diagnoses. The lack of a clinical history and psychiatric evaluation and records in the medical records made it difficult to analyze them better.

Keywords: ENEP; Diagnosis; Epidemiology; Comorbidities; Video electroencephalogram;

INTRODUCTION

Psychogenic nonepileptic events (PEEs) are symptoms of a conversion disorder that present as paroxysmal episodes ⁽¹⁾. They consist of abrupt and involuntary changes in behavior, sensations, motor activity, cognitive processing or autonomic function ⁽²⁾. Unlike epileptic seizures, this type of event is caused by a psychopathological process and not by the presence of abnormal neural activity in the brain ^(3,4).

Although its incidence is relatively low in the general population (around 1.5/100,000 people per year; approximately 4% of the incidence of epilepsy), between 25 and 30% of patients with refractory epilepsy referred to tertiary epilepsy centers end up with a diagnosis of ENEP ⁽⁵⁾. On the other hand, in children, although there is little epidemiological data on the subject, it is presumed to be lower, being observed between 0.3 and 0.5/100,000 children per year in some studies ⁽⁶⁾.

In addition to there being little epidemiological information on ENEP in children, there is very limited literature on the subject as a whole, since even though there are a wide variety of studies on this type of event, most of them deal with adults. This makes the clinical approach to this pathology difficult, since not only does the pediatric population have different clinical characteristics and risk factors compared to adults, but there are also differences in etiology, clinical presentation, associated factors, treatment and outcomes between children and adolescents ⁽⁷⁾.

Like age, gender is also a factor that influences the development and presentation of seizures. ENEP is more prevalent in females, but in younger age groups there is a decrease in this prevalence. As for precipitating stress factors, peer relationship problems and poor school performance were seen as the most prevalent among girls and boys, respectively. There is also a difference between the comor-

bid psychopathology most present in each gender: in girls, depression predominates and in boys, ADHD. Given these semiological and psychogenic differences, it is possible that ENEP in boys and girls are seen as different entities ⁽⁸⁾.

Another important point to note is the psychiatric comorbidities related to this condition. They are considerable in clinical populations with ENEP, especially when compared to the general population and controls with epileptic seizures. Among people affected by psychogenic seizures, the rates of PTSD, anxiety and personality disorders are higher ⁽⁹⁾. In the case of young people, data indicates that being a girl, older age, adversity and somatization are risk factors for both ENEP and comorbid internalizing disorders. However, the temporal relationship between psychogenic non-epileptic events, anxiety and depression is still unknown ⁽¹⁰⁾.

Video-EEG is considered the gold standard for diagnosis ⁽¹¹⁾. Although very useful tools such as this test are available, there are other factors that delay the diagnosis of non-epileptic psychogenic seizures in the pediatric population. This occurs mainly in younger children, which some authors believe is due to the fact that most child neurologists consider ENEP to occur predominantly in adolescence and not in younger children. In addition, inadequate diagnosis of epilepsy, inadequate treatment with antiepileptic drugs, psychological abuse and inadequate family environments have been major contributors to delayed diagnosis in young people. This ends up being

This is detrimental to the patient, since early diagnosis is associated with a better prognosis and prevents unnecessary and possibly harmful interventions. Furthermore, in the absence of a correct diagnosis of ENEP, related environmental stressors and iatrogenic measures can be perpetuated ^(6,12).

In view of the above, this research sought, through video electroencephalographic analysis of children diagnosed with ENEP and clinical-psychiatric correlations, to better understand this pathology in order to offer a better approach to patients.

METHODOLOGY

This is a cross-sectional study, approved by the Research Ethics Committee, carried out by collecting data from the medical records of patients in the child age group who underwent EEG video at the Hospital de Base de São José do Rio Preto between January 2015 and February 2021, with a survey of the clinical-psychiatric and electroencephalography aspects of these patients.

The medical records of 1,772 patients were analyzed, 27 of whom were included in the study. The inclusion criteria were patients diagnosed with a non-life-threatening event psychogenic epilepsy established by video-electroencephalography in the given period, with age belonging to the child age group. The exclusion criterion was patients under 5 years of age, due to the difficulty of diagnosing ENEP in this age range.

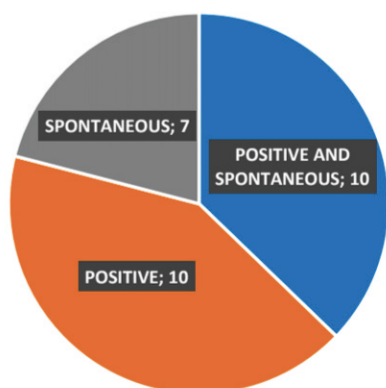
The objectives were to establish the frequency of psychogenic non-epileptogenic events in the pediatric age group of a tertiary hospital, to establish their rate of diagnosis through spontaneous events and events elicited by tests for non-epileptic events, to establish the correlation with epilepsy and to describe the psychiatric profile of this population.

The data was spreadsheeted in Excel, validated and descriptive statistical analyses were carried out, evaluating simple frequency for nominal or categorical variables and central tendency analysis (mean) for numerical variables.

RESULTS

From the data obtained from the 1,772 patients analyzed, 27 were diagnosed with ENEP, either by spontaneous crisis and/or positive provocative test, or by the alcohol-soaked absorbent cotton method or by intravenous administration of solution, both with concomitant verbal suggestion (graph 1), giving a prevalence of 1.5%.

EEG video diagnostics



Graph 1

The epidemiological analysis showed a predominance of females, corresponding to 59.25% of cases, resulting in a girl/boy ratio of 1.5:1. In addition, there was a higher prevalence of older children, with 66.6% of the patients were 10 years old or more and 33.4% were less than 10 years old, with an average age of 12.8 years.

With regard to comorbidities, ENEP was associated with epilepsy in 22.2% of cases. With regard to psychiatric disorders, only 12 patients had psychiatric analysis data recorded in their medical records, 66.6% of whom had one or more psychiatric comorbidities (Table 1).

Psychiatric Comorbidity	N	
Depression	1	8,30%
Anxiety	3	25%
Anxiety+ Depression	1	8,30%
Anxiety+ PTSD	1	8,30%
ADHD	2	16,70%
Absent	4	33,40%
Total	12	100%

Table 1 - Prevalence of Psychiatric Comorbidities Found

DISCUSSION

In view of the data related to video EEG, the prevalence of ENEP among patients who underwent this test at this epilepsy center was 1.5%. This figure is lower than that reported by Schwind et al, who pointed to an occurrence of ENEP varying between 3.5 and 20% of studies using video EEG ⁽¹³⁾.

With regard to diagnosis, it was observed that provocative tests, although controversial due to ethical concerns when placebos are used according to Patel et al⁽¹⁴⁾, were necessary for 37% of diagnoses in which there were no spontaneous seizures. This corroborates what was said by Benbadis et al, reaffirming how useful provocative tests can be, often transforming inconclusive evaluations into diagnoses, as in the cases cited ⁽¹⁵⁾.

A higher prevalence of females and older children was observed, as well as a high prevalence of psychiatric comorbidities in the patients, in line with the literature. Female gender and older age are also risk factors for internalizing disorders, PTSD, somatization and anxiety sensitivity in the general paediatric population. These overlapping risk factors for both conditions and the high prevalence of their association with ENEP, as found in this study, help us to believe that ENEP may be an evolutionary process of these other disorders when they are not properly recognized and/or treated ⁽¹⁰⁾. Although this study reinforced this hypothesis, it was unable to prove it, as it was a cross-sectional study.

Psychogenic events were also associated with epilepsy in more than a fifth of cases (22.2%), a rate even higher than that reported in the literature, of around 10%. These patients tend to use more psychiatric medication than those with pure psychogenic seizures ⁽¹³⁾. In addition, these patients may have their correct diagnosis postponed due to this association, corroborating the maintenance of stressful environmental factors and iatrogenies, worsening the patient's prognosis ⁽¹²⁾. This reinforces the importance of knowing how to differentiate one condition from the other and diagnose psychogenic events correctly, so the patient can receive the best treatment as soon as possible.

The limitations of this study were the lack of information in medical records related to clinical history and psychiatric history, limiting access to data that could be useful for a more in-depth analysis.

CONCLUSIONS

In view of this, it can be concluded that provocative tests, although sometimes controversial, can be a very useful tool in the diagnosis of NPEE, that females and older age are risk factors, that there is an important association between psychogenic events and epilepsy and psychiatric comorbidities and that complete medical records, with a good clinical history and psychiatric history, could help to better

understand this condition. Therefore, this study reinforces important aspects found in the literature; however, more studies are still needed, with a more complete database and/or with a prospective analysis to help have a more efficient approach to patients with Psychogenic Non-Epileptic Events.

INDIVIDUAL CONTRIBUTIONS

LP contributed to the design of the study, carried out data collection and statistical analysis, drafted and revised the manuscript. LH drew up the study design, helped with data collection, contributed to the interpretation of the data collected and made the final revision of the manuscript.

CONFLICT OF INTEREST

There are no conflicts of interest to declare.

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