
CASE REPORT

Emergency department management of epileptic seizures in children

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Protocols for the emergency medical management of epileptic seizures are available. However, for children with a diagnosis of epilepsy who recover their baseline neurological status after one or more seizures, there is a lack of consensus on follow-up care (eg, the need to order complementary tests or not, or where to refer the patient). We reviewed the cases of 164 patients with epilepsy who came to the emergency department with one or more seizures. The aim was to assess patient profile, the ordering of additional tests and whether the tests proved useful for managing the case. Sixty percent of the patients sought emergency care after a single seizure that resolved before arrival at the hospital. Blood tests were done in 29.9% (all were normal) and antiepileptic drug levels were measured in 22% (36.1% were too low). Although testing for antiepileptic drug concentrations offers the highest diagnostic yield, this test is subject to certain limitations that lead to reduced use. [Emergencias 2013;25:116-118]

Keywords: Emergency health services. Epilepsy. Children.

Introduction

The emergency department (ED) is often the first place where patients with epileptic seizure (ES) look for assistance. There are defined pharmacological management protocols for these cases¹⁻⁵. However, there is no consensus on how best to proceed after recovery of neurological status. The number of episodes, new antiepileptic drugs (AED) and etiology are important factors for decision-making⁶⁻⁸, but family anxiety and the need for assessment by a neurologist also influence the decision on where to refer the patient. The present study aimed to establish the typical profile of ED patients presenting with one or more episodes of ES, and to assess the utility of complementary examinations (CEs).

Clinical cases

The study was conducted in the ED of a third level maternal-infant hospital, a referral center serving 1,800,000 inhabitants, which in the year

2009 attended an average of 270 visits per day. We retrospectively reviewed medical reports issued between June 1 2009 and November 30, 2009 of patients aged < 18 years with previous diagnosis of epilepsy who attended the ED for one or more episodes of seizure. Epidemiological data, treatment with AEDs and current episode data (number of seizures, pharmacotherapy used, complementary tests, and medical destination). The criterion for soliciting such tests was based on the presence of a triggering her factor, the number and duration of seizures, and clinical consequences. For determination of AEDs we took into account whether the patient had taken such drugs within the previous period of three months. Quantitative variables were expressed as median and percentiles and qualitative variables as proportions. Statistical significance was considered as $P < 0.05$.

In the 6-month study period, we recorded 42,647 pediatric visits of which 164 (0.38%) were for ES. Of the 164 patients, 95 (57.7%) were male, median age 3.5 years (p25-75: 6 months-7 years) and 66 of these (40.2%) were younger

than 1 year. One hundred and forty three patients were receiving antiepileptic treatment (87.2%). The most commonly used drug was sodium valproate, in 64 patients (44.8%), followed by carbamazepine in 35 patients (24.5%) and levetiracetam in 31 patients (21.7%).

One hundred and one (61.3%) had experienced one episode of ES before attending the ED, 32 (19.6%) had had 2-4 episodes, and 31 (19%) had had more than episodes of ES. Prehospital medication was required in 58 (35%), of whom 42 (25% of total) received rectal diazepam and 15 (9%) one or two doses of benzodiazepine (BDZ) IV (Figure 1). In the emergency department, 138 (84%) did not require any AEDs. In the remaining patients, BDZ IV was used in most (19 patients, 12%) followed by rectal diazepam in 7 (4%). Blood tests were performed in 49 patients (29.9%), with no alterations detected. AED levels were determined in 36 (22%), and were found to be below therapeutic levels in 13 (36.1%). No other complementary tests were performed. We found intercurrent infection process in 45 cases (27.3%). As shown in Figure 2, no triggering factor was found in 100 patients (61%).

A total of 65 patients (39.6%) were hospitalized. A neurologist was consulted 27 times (16.6%). The patients admitted were those with a larger number of episodes on ED arrival ($P < 0.002$), and those requiring more blood tests ($P < 0.001$).

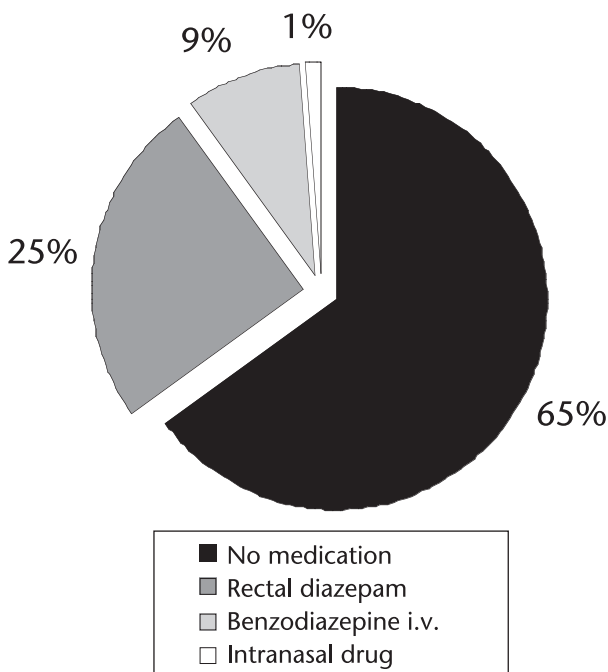


Figure 1. Prehospital pharmacotherapy to control the seizure.

Discussion

Seizures are the most frequent type of neurological emergency in children⁹. The incidence is higher in the first years of life due to predisposing neonatal factors³. This was borne out in our sample: median age was 3.5 years and 40.2% were infants aged <1 year. Notably, only 35.5% received pre-hospital medication, and 9% of these were administered at home by emergency teams; this percentage is significantly lower than the 19% reported by Galustyan et al¹⁰. The use of drugs in the ED was even lower since the vast majority (84%) arrived in the post-critical period.

Regarding the complementary tests considered necessary, there is no consensus in patients without a known trigger and who recover baseline neurological status. The Spanish Society of Neurology¹¹ advocates a laboratory analysis (CBC, glucose and electrolytes) for adults without a triggering mechanism. However, in children without additional signs or symptoms, there is no evidence to recommend anything more than glycemia levels.

In our center few complementary tests are performed, mainly because different aspects are evaluated as mentioned above. In addition, our laboratory only determines classical AED levels in real time, but not others such as levetiracetam (which was given to a quarter of the sample). So, the low percentage of complementary tests is due in large part to the fact that most (61.3%) of our sample had only a single episode and usually recovered without pharmacotherapy. These patients do not require urgent action, except to ensure recovery to the normal state and indicate the destination of the patient. However, despite the limitations previously mentioned of determining AED levels,

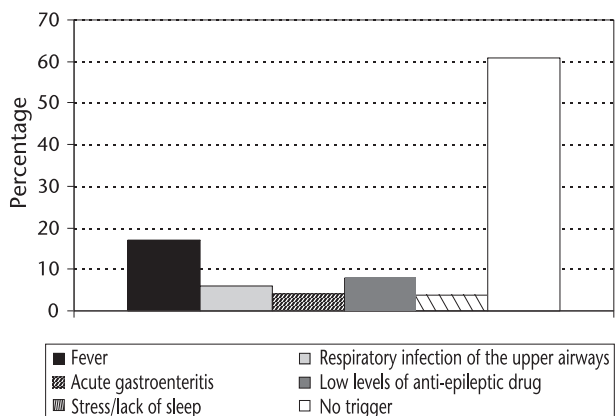


Figure 2. Etiology of epileptic decompensation.

in our study test showed the highest diagnostic yield.

The rate of admission was similar to the 44% found by Piñol-Ripoll et al.⁷ in adults. The criterion for admission was based on the characteristics of seizure (those with greater number of seizures were admitted significantly more often), but the need for evaluation by a pediatric neurologist was also taken into account. In our center this specialist is only available on morning shifts from Monday through Saturday, and this means there were more admissions than necessary. Some studies have found a significant association between lower admission rate and greater access to primary care and family educational level^{8,12}.

In the adult population, the main triggering factor for epileptic seizure is lack of therapeutic compliance (27-45%)^{7,8}. In pediatrics, infectious processes are more relevant, as reflected in our study where 27.3% of patients had this antecedent.

The limitations of our study include the retrospective method, which means that some data were not collected or there were pediatricians who do not follow the recommendations when soliciting complementary tests. Another limitation is that complementary tests were not performed in all patients. However, we believe this is correct: such tests should not be performed routinely in the ED for most cases with only one episode, fully recovered and with a neurologist accessible in a few hours. However, we believe that validation of protocols, along with neurologist availability,

could help optimize the management of such patients and reduce the rate of admissions and therefore costs.

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Manejo de la crisis epiléptica en urgencias en el paciente epiléptico pediátrico

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Existen protocolos definidos del manejo farmacológico de una crisis epiléptica (CE) en urgencias, pero donde no hay consenso es en el enfoque posterior (necesidad de realizar exploraciones complementarias o destino) del paciente pediátrico epiléptico conocido que tras una o más CE recupera su estado neurológico basal. Se presentan 164 pacientes con epilepsia que acuden a urgencias por presentar una o más CE y se valora su perfil y si las exploraciones complementarias, cuando éstas se realizan, son de utilidad. Un 60% de los pacientes acuden tras una única CE que cede a nivel prehospitalario. Se realiza analítica sanguínea al 29,9% (todas sin alteraciones) y niveles de fármaco antiepiléptico (FAE) al 22% (resultan alterados el 36,1%). La determinación del nivel de FAE, aunque es la prueba que ofrece mayor rendimiento diagnóstico, en la práctica tiene una serie de limitaciones que hacen que sea poco utilizado. [Emergencias 2013;25:116-118]

Palabras clave: Servicio de urgencias. Epilepsia. Niños.