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ORIGINAL ARTICLE

Impact of a rapid systemic guide on pediatric patients with suspicion of epilepsy

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Abstract
Objectives: Increase the percentage of etiological diagnosis of epilepsy (according to the classification by the 2010 ILAE) using a systematic quick guide for pediatric patients with suspected epilepsy.
Methods: Ambispective cohort study. Patients under 16 years old with suspected epilepsy were studied, and a systematic quick guide was applied to the prospective group, and later the two groups were compared. It was a convenience sample, with a study period of one year for both groups.
Results: The prospective group was 120 patients and the retrospective group 71 patients. Comparing the epileptic diagnosis by etiology groups, in the prospective group (only outpatient patients), 3.3% had epilepsy of an unknown cause, 55% had epilepsy of a genetic cause, 36.7% had epilepsy of a structural/metabolic cause, and 5% had conditions that are not epilepsy itself. Meanwhile in the retrospective group, 52.1% had epilepsy of an unknown cause, 11.3% had epilepsy of a genetic cause, and 36.6% had epilepsy of a structural/metabolic cause ($p < 0.001$).
Conclusions: Compared to other similar studies, the etiological percentages of epilepsy increased. Using the systematic quick guide proposed, the percentage of etiological definitions of epilepsy was increased in pediatric patients.

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Introduction

Seizure, according to the International League Against Epilepsy (ILAE), is the transitory occurrence of signs and/or symptoms due to abnormal excessive synchronous neuronal activity in the brain.[1] Epilepsy is a disorder of the brain defined as the presence of hyper synchronous neuronal activity, which is clinically expressed by any of the following circumstances[2]:

- At least two unprovoked or reflex seizures occurring more than 24 hours apart.
- An unprovoked or reflex seizure, and a probability of presenting further seizures over the next 10 years, similar to the general recurrence risk (at least 60%) subsequent to the onset of two unprovoked seizures.
- As an integral part of an epileptic syndrome.

An epilepsy syndrome is a group of signs and symptoms which define a unique epileptic condition, made up of convulsive crises with specific characteristics, onset age, gender predominance, etiology, cognitive or behavioral comorbidity, daily variation or its link to sleep and family history. Some triggering factors are: sleep deprivation, photic stimulation, hyperventilation, etc., which has direct implications in its management, evolution and prognosis within neurodevelopment and the result of the epilepsy, genetic tests and inheritance.[3]

In Mexico, the prevalence in the Priority Programs for Epilepsy centers is 11–15/1000, thus this numbers suggest that in our country the number of patients with epilepsy is around 1.5 million.[4] In 2010, the ILAE redesigned the classification of seizures and epilepsy crises; dividing them into generalized, focal and unknown crisis (epileptic spasms).[5] Regarding to electro-clinical syndromes and other epilepsies, they were classified according to the age of onset and specific etiology as follows: genetic, structural/metabolic, of unknown causes, and in conditions which are not actual epilepsy.[5]

The objective of this paper was to increase the percentage of epilepsies etiologic diagnoses in pediatric patients (according to the classification by the 2010 ILAE) using a systematic quick guide in pediatric patients with suspected epilepsy.

Materials and methods

An ambi-directional cohort study was conducted, with interventionism in the prospective group (with the application of the proposed systematic quick guide). The sample size was at convenience, all patients who arrived during one year in both groups.

The first group studied was the prospective group, a systematic quick guide was used in this group (see annex 1). *Inclusion criteria*: patients under 16 years of age who attended the ''Dr. José E. González'' University Hospital in Monterrey, Nuevo León, México (at its hospital admission area or outpatient clinic) for the first time with suspicion of epilepsy, and who have been assessed by the Pediatric Neurology Service between June 18, 2014 and June 17, 2015. *Exclusion criteria*: Those patients who were 16 years old or older. *Elimination criteria*: Patients with an incomplete systematic quick guide, patients with an incomplete clinical file, patients who were ruled out of having epilepsy, and epileptic patients who did not complete the minimum studies (EEG and/or imaging studies) in order to classify them etiologically.

After finishing the prospective group, the retrospective group began. We searched for the registries of every patient who attended the Pediatric Neurology Outpatient Clinic for the first time. All the files from those patients were reviewed, obtaining epidemiological data and etiological diagnoses of all patients with epilepsy. *Inclusion criteria*: Patients under 16 years of age, with suspicion of epilepsy. *Exclusion criteria*: Patients who were 16 years of age or older. *Elimination criteria*: Patients who were ruled out of having epilepsy and patients with incomplete clinical files.

Databases for both groups were set up using Microsoft Excel 2010. Subsequently, a statistical analysis was performed using SPSS version 20, where a descriptive statistical analysis of the prospective and retrospective groups was completed, then the comparison between both groups was conducted using Pearson's chi square test (for the variables: gender and etiological diagnosis of epilepsy) and the Student *T*-test (for the age variable). A $p < 0.05$ value was determined as a statistically significant result. This work was approved by the Ethics Committee of the School of Medicine at the Autonomous University of Nuevo Leon on April 20th, 2015, with the registry code NR15-003.

Results

The proposed systematic quick guide was conducted on 137 patients with suspicion of epilepsy. Eight patients were ruled out of having epilepsy, and thus were eliminated, and another 9 patients with epilepsy were eliminated as well because they did not comply with the minimum tests (EEG and/or imaging studies) in order to classify them etiologically. The prospective group included 120 patients, while the retrospective group included 71 patients.

First, a description of the prospective group was done (Tables 1 and 2), and the Denver II tool was used to evaluate the patients' psychomotor capability. Subsequently, an age comparison between prospective groups (patients admitted plus outpatients, and only outpatients) and the retrospective group was conducted (Table 3). Lastly, a comparison of epilepsy diagnosis by etiological groups was done between prospective groups (patients admitted plus outpatients, and only outpatients) and the retrospective group (Table 4).

Discussion

A total of 120 patients were included in the prospective group and 71 patients in the retrospective group. Average age was 6.3 years for the first group and 7.7 for the second group, compared to a study conducted in Spain where the average age was 5.2 years.[6] Gender distribution in the prospective group was 66.7% male and 33.3% female, whereas for the retrospective group the distribution was 66.2% male and 33.8% female, compared to a study conducted in Turkey where 59.3% of the patients