RESEARCH ARTICLE

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Received: 19.04.2022
Acceptance: 21.06.2022
DOI: 10.18521/ktd.1118913

Konuralp Medical Journal
e-ISSN1309–3878
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Evaluation of Pediatric Patients with First Seizure

ABSTRACT

Objective: Pediatric seizure is a condition that occurs due to many different underlying causes and causes fear and anxiety in families. In our study, it was aimed to evaluate pediatric seizure cases who applied to our hospital.

Methods: Patients aged 0-18 years, who applied to the pediatric emergency department of our hospital between May 2018 and May 2020, were retrospectively analyzed. The patients were evaluated in terms of age, gender, seizure types, familial genetic predisposition, examination, treatment and follow-up. Seizures were divided into 2 groups as focal and generalized according to the International League Against Epilepsy (ILAE) 2017 classification. The treatment methods applied with cranial magnetic resonance imaging and electroencephalography recordings of the patients were evaluated.

Results: Of the 118 patients included in the study, 70 (59 %) were girls and 48 (41 %) were boys. The mean age was 60 (3-192) months. Family history was present in 18 (15 %) cases. 8 (7 %) of the seizures are partial and 110 (93 %) of them are generalized. Since seizure recurrence was observed within 24 hours in 5 of 36 patients who were evaluated as febrile seizures, they were evaluated as complicated febrile seizures and drug treatment was started. The other 31 patients were evaluated as simple febrile seizures. There was no biochemical abnormality in the seizure etiology in any of the cases. Cranial magnetic resonance imaging revealed polymicrogyria in 2 patients, hydrocephalus in 2 patients, brain tumor in 1 patient, and arteriovenous malformation in 1 patient.

Conclusions: In cases presenting with seizures, the underlying causes should be identified and their treatment should be arranged. Cases with recurrent seizures should also be followed closely.

Keywords: Child, First Seizure, Treatment.

Çocuk Acile İlk Nöbet ile Başvuran Olguların Değerlendirilmesi

ÖZET

Amaç: Pediatrik nöbet, altındaki birçok farklı nedene bağlı oluşan ve ailelerde korku ile endişeye yol açan bir durumdur. Çalışmamızda hastanemize başvuran pediatrik nöbet olgularının değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Mayıs 2018 ile Mayıs 2020 tarihleri arasında hastanemiz çocuk aciline nöbet ile başvuran 0-18 yaş arası hastalar retrospektif olarak incelendi. Hastalar yaş, cinsiyet, nöbet tipleri, ailesel genetik yatkınlık, tetkik, tedavi ve takip açısından değerlendirildi. Nöbetler International League Against Epilepsy (ILAE) 2017 sınıflamasına göre fokal ve jenaralize olarak 2 gruba ayrıldı. Hastaların kranial manyetik rezonans görüntüleme ve elektroensefalografi kayıtları ile uygulanan tedavi yöntemleri değerlendirildi.

Bulgular: Çalışmaya dahil edilen 118 hastanın 70 'i (%59) kız, 48' i (%41) erkekti. Yaş ortalaması 60 (3-192) ay idi. Aile öyküsü 18 (% 15) olguda mevcuttu. Nöbetlerin 8' i (% 7) parsiyel, 110' u (% 93) jenaralize nöbetti. Febril nöbet olarak değerlendirilen 36 hastanın 5' inde 24 saat içerisinde nöbet tekrarı görüldüğü için komplike febril nöbet olarak değerlendirilip ilaç tedavisi başlandı. Diğer 31 hasta basit febril nöbet olarak değerlendirildi. Nöbet etiyolojisinde hiçbir olguda biyokimyasal anormallik yoktu. Kranial manyetik rezonans görüntülemede 2 hastada polimikrogri, 2 hastada hidrosefali, 1 hastada beyin tümörü ve 1 hastada da arteriovenoz malformasyon saptandı.

Sonuç: Nöbet ile başvuran olgularda altta yatan nedenler tespit edilerek tedavileri düzenlenmelidir. Tekrarlayan nöbetleri olan olguların da yakın takibe alınması gerekmektedir.

Anahtar Kelimeler: Çocuk, İlk Nöbet, Tedavi

INTRODUCTION

There are channels in the brain that provide inhibition and excitation. Seizure is defined as an abnormal electrical neuron discharge in the brain. The incidence of seizure varies between 0.5 % and 0.8 % in various studies (1). It is a condition that occurs due to many different reasons and causes fear and anxiety in families. Today, with the progress in the genetics department, it has been determined that most cases have genetic etiology. Any damage to the cerebral cortex can also lead to the development of seizures. Fever, hypocalcemia, hypoglycemia, trauma, infection, meningitis, encephalitis, intracranial hemorrhage, intracranial mass, cerebral dysplasia can trigger seizures (2).

Evaluation of the patient is important in predicting the cause of the seizure, the need for treatment with antiepileptic medication, the potential for response to treatment, and future recovery (3). Seizure-related morbidity and mortality require the implementation of seizure control strategies (4). Knowing the seizure types, frequency, general characteristics and resistant seizure rates of the patients admitted to the hospital will be of great benefit in patient management (5).

In this study, considering the diagnostic criteria of International League Against Epilepsy (ILAE) 2017 seizure types, causes of seizures, accompanying risk factors, recurrences, clinical course, medical and familial history of the patients, and electroencephalography It was aimed to evaluate (EEG) recordings, brain magnetic resonance imaging (MRI) findings and drug treatments applied.

MATERIAL AND METHODS

Pediatric cases under the age of 18 years, who were brought to the Pediatric Emergency Department of our hospital due to epileptic seizures between May 2018 and May 2020, were included in the study and the data were analyzed retrospectively. The patients included in the study were followed up, and the families were informed, and a consent form was obtained for the study. Ethical approval (ODU KAEK 17.09.2020/19/183) was obtained from Ordu University Clinical Research Ethics Committee for the study.

In the pediatric emergency, the first emergency interventions of the patients were performed first. Afterwards, the child was taken into observation and evaluated by neurology. Age, gender and familial genetic predispositions of the patients were questioned. Accompanying metabolic imbalance, fever were examined. Seizures were divided into 2 groups as focal and generalized according to the ILAE 2017 classification (6). The seizure that occurred 24 hours after the first seizure was considered as seizure recurrence. Conditions such as syncope, wheezing, tics, and movement disorders that were not considered as seizures after presenting with the complaint of seizures were not included in the study. Cases who did not have a first seizure and had seizure uncertainty in the past were not included in the study. The cases who had the first seizure when they applied to the emergency department and were followed up for one year were included in the study.

Cranial magnetic resonance imaging (MRI) and electroencephalography (EEG) records of the patients who were followed up were evaluated. The antiepileptic drugs used, how long they were used, their doses, and whether they were used regularly were monitored throughout the study.

Statistically Analysis: The data were analyzed by SPSS 15.0 (SPSS Inc., Chicago, IL, USA) program. Shapiro-Wilk test was used to find out whether the data were distributed normally. The data which were normally distributed were expressed in terms of average±standard deviation, while the data which were not normally distributed were expressed in terms of mean (min-max).

RESULTS

Of the 118 patients included in the study, 70 (59 %) were girls and 48 (41 %) were boys. The mean age was 60 (3-192) months. Fifty (42.3 %) of the patients were under the age of 6, 36 (30.5 %) were between the ages of 6-12, and the remaining 32 (27.2 %) were between the ages of 12-18 (Table 1).

Table 1. Characteristics of patients

Age (year)	***n (%)***
< 6	50 (42.3 %)
6-12	30 (30.5 %)
>12	32 (27.2 %)
Gender	***n (%)***
Male	48 (41 %)
Female	70 (59 %)
Seizure type	***n (%)***
Parsial	8 (7 %)
Generalize	110 (93 %)
Total	**118**

Eight patients (7 %) of the seizures are partial and 110 (93 %) of them are generalized. Thirty-two of 36 patients, who were evaluated as seizures accompanied by fever, were under the age of 6 and were considered as febrile seizures. Since seizure recurrence was observed within 24 hours in 5 of 36 patients who were evaluated as febrile seizures, they were evaluated as complicated febrile seizures and drug treatment was started.

There was no biochemical abnormality in the seizure etiology in any of the cases. Cranial magnetic resonance imaging revealed polymicrogyria in 2 patients, hydrocephalus in 2 patients, brain tumor in 1 patient, and arteriovenous malformation in 1 patient (Table 2). Partial seizure were observed in brain tumor, arteriovenous malformation and 1 hydrocephalus patient.

Table 2. Magnetic rezonans imaging findings

Pathology	***n (%)***
Polymicrogyria	2
Hydrocephalus	2
Brain tumor	1
Arteriovenous malformation	**1**

Family history was present in 18 (15 %) cases, was found to be 11 in 36 patients with febrile seizures. Of these patients, 2 had complicated febrile seizures, 8 had simple febrile seizures, and 1 had seizures accompanied by fever over the age of 6 years. 4 of 50 patients under the age of 6 who had seizures were being followed up in child psychiatry because of special learning difficulties.

EEG was applied to all of the patients and abnormality observed in 42 of them. In cases with abnormality in brain MRI, localization finding was observed in EEG. EEG was normal in cases evaluated as simple febrile seizures. Medication was recommended to all patients with EEG abnormalities. Valproate and levetiracetam were started for generalized seizures, and carbamazepine or oxcarbamazepine was started for those with focal seizures. Phenobarbital was started in patients under 2 years of age who were prescribed medication. Seizure recurrence was observed in 18 of 42 patients with EEG abnormality, and drug doses were adjusted.

DISCUSSION

Seizure is defined as excessive and abnormal brain discharge in the brain (7). While various genetic, metabolic and neurological conditions may be involved in its etiology, no cause may be detected. Its incidence is stated as 1% (8). It has been observed that 75% of epilepsies in adulthood begin in childhood (9).

Hamiwka et al. male/female ratio has been reported as 0.7 in epilepsy cases (10). Berg and Shinnar reported an equal male/female ratio in their study (11). Okumura et al. reported the age range as 7-69 months in their studies and 1-77 months in the Ling study (12,13). In our study, the male/female ratio was 0.68, the age range was 3-192 months, and the mean age was 60 months.

Although genetic factors are known to play a role in the development of seizures, genetic transmission has not been fully elucidated (3). Family history of epilepsy has been reported as 7.5-9.7% in studies (1). In our study, a family history of epilepsy was found at a rate of 15%. 11 of these 18 cases were febrile seizures. A history of febrile seizures in first-degree relatives, having the first seizure under the age of one, presence of fever for a short time before the seizure, and low-grade fever during the first febrile seizure are listed as factors that increase the risk of recurrence of the febrile seizure (14).

EEG is frequently used in the diagnosis of seizures, classification of seizures, and the decision to start treatment (9). Having a sleep EEG and applying hyperventilation-photic stimulation in the EEG increase the frequency of pathology detection. Camfield et al. found anomaly in neurological findings, spike-wave finding in EEG and seizure recurrence rate of 96% in the presence of accompanying complex partial seizures (15). EEG was applied to all of the patients and abnormality observed in 42 of them. In cases with abnormality in brain MRI, localization finding was observed in EEG. EEG was normal in cases evaluated as simple febrile seizures. In the literature, the rate of abnormal findings in brain MRI has been reported as 14% (9). MRI was also performed in all cases included in our study. During the MRI, some children did not stop due to age, so chloralhydrate was given to the patients as a medicine and they were anesthetized. Cranial magnetic resonance imaging revealed polymicrogyria in 2 patients, hydrocephalus in 2 patients, brain tumor in 1 patient, and arteriovenous malformation in 1 patient. In our patients, the rate of MRI pathology was found to be 5%, which is lower than the literature. This situation has been associated with more febrile seizures coming to the pediatric emergency room.

In cases evaluated with seizures, drug treatment is decided according to seizure type, etiology, familial history, and whether there is an abnormality in EEG or MRI (16). There is a wide variety of antiepileptic treatments available (17). While antiepileptic is not recommended for simple febrile seizures, it is recommended in complicated febrile seizures. (18). Proper use of anti-epileptic therapy should be controlled with intermittent blood tests. Families should be informed about drug allergy. In our cases medication was recommended to all patients with EEG abnormalities. Valproate and levetiracetam were started for generalized seizures, and carbamazepine or oxcarbamazepine was started for those with focal seizures. Phenobarbital was started in patients under 2 years of age who were prescribed medication. Seizure recurrence was observed in 18 of 42 patients with EEG abnormality, and drug doses were adjusted.

Although simple febrile seizure should not be hospitalized if the patient is in a good condition, hospitalization for observation is necessary when a child presents with red flag sign and symptoms (4). We kept the all cases under surveillance at least 12 hours against complication.

The limitations of the study are that the data on seizure types were obtained from the descriptions of the families, and we had limited resources and information to determine the underlying causes of the first seizure as of the date of the study. The maximum observation period of the patients is 2 years, and the longer follow-up period in these diseases with long-term treatment will provide more reliable information.

In conclusion, it is important to correctly classify seizures in patients presenting with the first seizure, to investigate the etiology, to start medication in patients diagnosed with epilepsy, to follow up the patients in terms of drug side effects and clinically.

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