

Acute first seizures and seizure-like events in the pediatric emergency unit**Çocuk acil servisinde akut ilk nöbet ve nöbet benzeri olaylar**

Saz U Cağlayan E Serdaroglu G Aydogdu S Mir S Tekgul H
Ege Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları, İzmir, Türkiye

Summary

Aim: We studied the etiological spectrum of children with acute first seizures and seizure-like events in the pediatric emergency unit of a tertiary care hospital.

Material and Methods: Seventy-five children were related to acute first seizures and 32 children were to seizure-like events.

Results: Syncope (17%) was the most common cause of seizure-like events. Epilepsy was identified for 28 (37%) children with acute first seizure. Nine children (12%) were considered as first unprovoked afebrile seizure. The remaining seven children with acute first seizure (9.3%) had acute symptomatic seizures based on the extensive metabolic screening and MRG studies. Fifteen children (20%) had seizure reoccurrence in the emergency unit.

Conclusion: Status epilepticus occurred in 4 patients (5.3%) and those were admitted into the intensive care unit.

Key words: seizure, etiology, emergency room.

Özet

Amaç: Bu retrospektif çalışmada Çocuk Acil Servisine nöbet ve nöbet benzeri olaylar nedeniyle getirilen çocuklarda etyolojik nedenler araştırıldı.

Yöntem ve Gereç: Yetmiş beş çocuk akut nöbet ve 32 çocuk nöbet benzeri olaylar nedeniyle çalışmaya dahil edildiler. Nöbet ve nöbet benzeri olaylar tanımlanarak etyolojik nedenler gözden geçirildi.

Bulgular: Nöbet benzeri olaylar arasında senkop %17 en sık karşılan non-epileptik fenomen olarak belirlendi. Epilepsi tanısı 28 çocukta (%37) vardı. İlk afebril nöbet 9 çocukta (%12) tanı olarak konuldu. Akut semptomatik nöbet tanısı 7 çocukta (%9.3) metabolik tarama testleri ve kraniyal MRG incelemeleri ardından konuldu. Acil serviste nöbet rekürrensi 15 çocukta (%20) gözlemlendi.

Sonuç: Acil servise ilk nöbet yakınması ile getirilen 4 çocukta (%5.3) status epileptikus izlendi

Anahtar Kelimeler: nöbet, etyoloji, acil servis.

Introduction

Seizures are a common presentation in the emergency care setting. Children who present to emergency units with acute seizures have a potentially broad range of associated problems requiring the appropriate approach. These patients may rarely present with status epilepticus, which requires proper management to ensure optimal outcome (1).

There are also many seizure-like non-epileptic paroxymal events including breath-holding spells, syncope, night terrors, and gastroesophageal reflux which are all commonly mistaken for a convulsive seizure (2).

The etiologic spectrum and outcome of seizures and seizure-like events are different in developing countries when compared with developed countries (3-7). In this study we evaluated the etiologic spectrum of children with acute first seizures and seizure-like events in the pediatric emergency unit of a tertiary care hospital in a developing country.

Yazışma Adresi: Hasan TEKGÜL
Ege Üniversitesi Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları
Anabilim Dalı, İZMİR
Makalenin Geliş Tarihi: 12.04.2010 Kabul Tarihi:04.06.2010

Patients and Methods

The medical records of all the patients seen in the emergency department of Ege University Hospital were reviewed for one year period from April 2004 through April 2005. During this period, 19,756 children visited the pediatric emergency unit. One-hundred and seven (0.54%) children who presented with seizures or seizure-like events were included in the study.

Demographic data, medical history, presenting complaint, systematic semiologic evaluation by the pediatric neurology fellow and /or attending, discharge diagnosis and follow-up in pediatric neurology outpatient clinic were ascertained. All of these patients were consulted by a neurology fellow and/or attending while in the pediatric emergency unit.

Final diagnosis of epilepsy was made according to ILAE classification criteria (2001) based on Electroencephalography and/or diagnostic imaging findings including Computed Tomography and Magnetic Resonance Scans during the hospitalization or follow up by the neurology outpatient clinic. The study was approved by the Ege University Human Subjects Ethics Review Board.

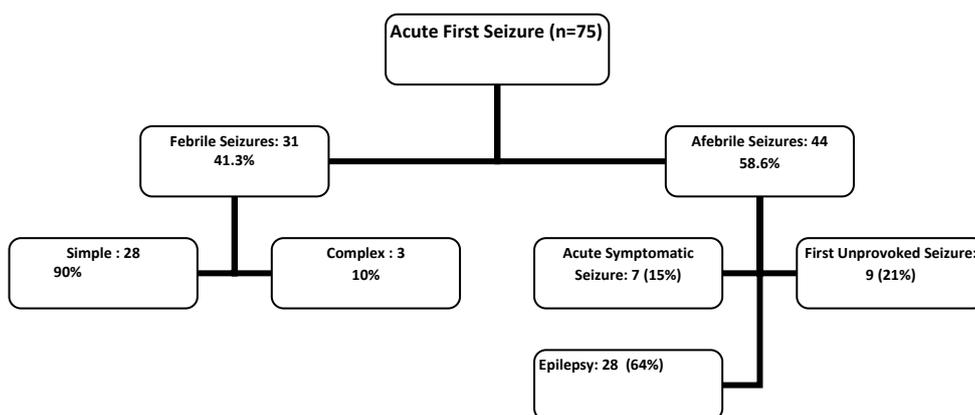
Results

The study group consisted of 75 children (0.37%) with acute first seizures and 32 children (0.16%) with seizure-like events: syncope (n=23), mental status change (n=6) (4 conversion disorder, 2 anxiety disorder) and behavioral disorder for 3 (2 depression, 1 bipolar disorder). The mean age of the group was 5.4 years, ranging from 3 months to 18 years.

Seventy-five children with an acute first seizure were systematically studied to define the etiologic spectrum (Figure-1). Afebrile seizures were the most common presentation followed by febrile seizures (58.6% vs. 41.3%). The prevalence of first-time seizures was significantly higher in patients with febrile seizures (n=28 / 31, 90.4%) as compared to patients with afebrile seizures (n=16 / 44, 21.3%) p < 0.001. Nine patients (12.0%) who presented with afebrile seizures had no etiologic factor and were categorized as having a first unprovoked seizure. Twenty eight (63.3%) of patients with afebrile seizures had an established diagnosis of epilepsy prior to the presenting episode. Other causes of afebrile epilepsy in decreasing frequency, included three children with central nervous system infections, two children with neurocutaneous disease, and one child with an intracranial mass. The youngest patient in our study was three months old. He had a premature delivery and presented with a typical hypocalcemic seizure.

Twenty-five patients had a single episode of witnessed seizure in the emergency unit, whereas fifteen patients had recurrent witnessed seizures. The remaining patients were diagnosed with seizures during the follow-up period. Status epilepticus only occurred in 4 (5.3%) children, and 23 (30.6%) patients were admitted to the hospital for further evaluation and treatment. Seven (30.4%) of all admissions patients were to the intensive care unit, followed by three (4.0%) to the infectious disease inpatient service for central nervous system infections.

Figure 1. The etiologic spectrum of children with an acute first seizure in the pediatric emergency unit of a tertiary care hospital



Discussion

This study demonstrates that afebrile seizures (59%) are the most common type of acute seizures in the emergency unit of a tertiary care hospital. According to population-based studies, afebrile seizures occur in 1% of children under 20 years of age of whom 65% will not have any further seizures (5). However 37% of children with acute first seizure in our cohort had an established diagnosis of epilepsy. More than 30% of patients with epilepsy have inadequate control of seizures with drug therapy (1). Patients who have an inadequate response to antiepileptic therapy may have refractory epilepsy and must be followed up closely by their neurologist.

Febrile seizures are seen relatively common, with a prevalence of 2-5% in children aged between 6 months to 6 years (3,4). Febrile convulsions with 41% were similar with previously reported incidences ranging between 48-52% (9,10). Berg and Shinnar reported that 87% of febrile seizures were simple as compared to 9% which were complex (4). The prevalence of simple febrile seizures (90%) and complex seizure (9.4%) in our cohort was consistent with their report.

Overall, seven patients (9%) had acute symptomatic seizures, however when febrile seizures were excluded the acute symptomatic seizure rate was 16% (7 of 44). One recent study which was conducted by Dogui et al. from Tunisia showed that only eighteen children (10%) had acute symptomatic seizures (7). Verity et al. have reported 28% of 84 patients had symptomatic seizures in their series (8). Smith et al. showed that symptomatic seizures rate in their series was 35% (1). Nine patients called first unprovoked seizure without underlying etiologic factor. This group should be closely followed-up since they might have increased risk of a recurrent seizure. The risk of having a second seizure episode has been investigated in several studies. At any given time, the reported risk of recurrence is highly variable. At the one year follow-up, the rate of recurrence was reported to be as low as 14% up to 65% (9,10). Previous reports were unable to identify strong predictors of recurrent seizures. Methodologic differences in these studies including definition of

seizures, age groups analyzed recruitment, and follow-up time of study participants may also contribute to this variability.

A significant number of children with seizure and seizure-like referred to pediatric epilepsy clinics might have seizure-like presentations non-epileptic paroxysmal events (1,2). Many pediatric epilepsy centers find that least 20% of referrals fall into this category (11,12). In our study syncope (17%) was the most common cause of seizure-like events. This phenomenon is most commonly mistaken for a convulsive seizure. However, a careful history, as well as a complete physical examination with semiologic evaluation are often the most useful tools for identifying an etiology and directing further evaluation of a syncopal event.

Status epilepticus is a serious and often life-threatening medical emergency and requires prompt intervention. Previous studies demonstrated that the incidence of status epilepticus changed between 2% and 7% (1,22). In the series reported by Koh et al., and Smith et al. status epilepticus was found 5% of the children (1,12). In our study we found that incidence of status epilepticus was 5.3% which was exactly same with the study reported by Smith et al. (9).

The hospital admission rate was 31% in our series and was very similar to the study which was reported by Krumholz and his colleagues (31.5%)(5). However, Sogawa et al. reported that 59% of children were admitted for observation (11). According to this study multiple seizures before emergency department arrival was the only significant risk factor that correlated with the recurrence of seizure within 24 hours. In the present study, 20% of the children had a seizure reoccurrence during their 24 hour stay in the emergency unit.

In conclusion, the most common seizure in pediatric emergency room appears to be afebrile seizures which are frequently seen in patients with established epilepsy. Future studies are needed to define the clinical significance of early EEG examination in the emergency unit for the diagnosis of epilepsy and identification of risk stratification.

Kaynaklar

1. Smith RA, Martland T, Lowry MF. Children with seizures presenting to accident and emergency. *J Accid Emerg Med.* 1996;13(1):54-8.
2. Uldall P, Alving J, Hansen LK, Kibaek M, et al. The misdiagnosis of epilepsy in children admitted to a tertiary epilepsy centre with paroxysmal events. *Arch Dis Child.* 2006 Mar;91(3):219-21.

3. Nelson KB, Ellenberg JH: Predictors of epilepsy in children who have experienced febrile seizures. *N Engl J Med* 1976; 295:1029-1033.
4. Berg AT, Shinnar S. Complex febrile seizures. *Epilepsia* 1996; 37:126-33.
5. Krumholz A, Grufferman S, Orr ST, Stern BJ. Seizures and seizure care in an emergency department. *Epilepsia*. 1989 Mar-Apr;30(2):175-81.
6. R. Belderbos, V. Rundran, V. Nanduri. An evidence based guide to investigation in nonfebrile convulsions. *Arch Dis Child* 2002;86(Suppl I): A 40-A4).
7. Dogui M, Jallon P, Tamallah JB, Sakly G, et al. Episousse: Incidence of newly presenting seizures in children in the Region of Sousse, Tunisia. *Epilepsia*. 2003 Nov;44(11):1441-4.
8. Verity CM, Ross EM, Golding J. Epilepsy in the first 10 years of life: Findings of the child health and education study. *BMJ* 1992; 305: 857-61.
9. Hauser WA, Rich SS, Annegers JF, Anderson VE. Seizure reoccurrence after a first unprovoked seizure: An extended follow-up. *Neurology*. 1990;40:1163-1170.
10. Shinnar S, Berg AT, Moshe SL, O'Dell C, et al: The risk of seizure reoccurrence after a first unprovoked afebrile seizure in childhood: An extended follow-up. *Pediatrics* 1996 Aug;98(2 Pt 1):216-25.
11. Sogawa Y, Maytal J. Emergency department admission of children with unprovoked seizure: Reoccurrence within 24 hours. *Pediatr Neurol*. 2006 Aug;35(2):98-101.
12. Koh S, Mathern GW, Glasser G, Wu JY, et al: Status epilepticus and frequent seizures: Incidence and clinical characteristics in pediatric epilepsy surgery patients. *Epilepsia*. 2005 Dec;46(12):1950-4.