

SEIZURE RELATED ACCIDENTS AND INJURIES IN CHILDHOOD

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Abstract – Several studies show that the risk of accidents involving patients with epilepsy is much higher compared to the general population. The objective of this study was to identify the frequency and type of seizure related injuries in children diagnosed with epilepsy. In addition we also assessed possible risk factors associated with this seizure related accidents in childhood. This study was conducted at the pediatric epilepsy clinic of UNICAMP, from January 2005 to August 2006. We evaluated 100 consecutive children with epilepsy. Parents were interviewed by one of the authors using a structured questionnaire that included questions about seizure related accidents and related injuries. Forty-four patients reported seizure related accidents. Eighteen patients needed medical assistance at an emergency room due the severity of their seizure related accident. Forty patients reported having a seizure related accident prevented by a bystander. Another 14 patients reported avoiding a seizure related accident by luck alone. Contusions and lacerations were the most common type of lesion associated with seizures. Patients with symptomatic/probable symptomatic epilepsy and those using higher numbers of anti-epileptic drugs (AEDs) were at greater risk for seizure related accidents ($p < 0.05$). We conclude that patients with symptomatic/probable symptomatic epilepsy and on multiple AEDs are at increased risk of seizure related accidents. Parents and caretakers should be even more cautious about risk of injury in such patients.

KEY WORDS: children, epilepsy, accident.

Acidentes e lesões associados às crises epilépticas na infância

Resumo – Vários estudos mostram que o risco de acidentes envolvendo pacientes com epilepsia é muito maior do que na população geral. O objetivo desse estudo foi identificar a frequência e tipo de acidentes relacionados a crises epilépticas em crianças com diagnóstico de epilepsia. Além disso, também avaliamos os fatores de risco associados às crises epilépticas na infância. Esse estudo foi realizado em nosso ambulatório de epilepsia infantil da UNICAMP, no período de janeiro de 2005 a agosto de 2006. Avaliamos 100 pacientes consecutivos. Os pacientes foram entrevistados por um dos autores, utilizando-se um questionário sobre acidentes e lesões associadas às crises epilépticas. Quarenta e quatro pacientes apresentaram acidentes relacionados às crises epilépticas. Dezoito pacientes precisaram assistência médica em pronto socorro devido à gravidade das lesões. Quarenta pacientes relataram que um acidente foi evitado devido ao socorro de uma outra pessoa. Outros 14 pacientes relataram que um acidente foi evitado apenas por sorte. Contusões e lacerações foram os tipos de lesão mais comuns. Pacientes com epilepsia sintomática ou provavelmente sintomática, e pacientes em uso de politerapia apresentaram maior risco de acidentes relacionados às crises epilepticas ($p < 0.05$). Concluímos que pacientes com epilepsia sintomática/provavelmente sintomática em uso de politerapia apresentam risco de acidentes elevado. Familiares e cuidadores desses pacientes devem ser ainda mais cautelosos sobre o risco de lesão associada às crises epilépticas.

PALAVRAS-CHAVE: criança, epilepsia, acidente.

Epilepsy is common in childhood, especially during the first two years of life¹. Several studies show that the risk of accidents involving patients with epilepsy is higher than the risk in the general population. The most common accident types are falls, drowning, choking and burns²⁻⁹.

Childhood is an accident-prone age, and epilepsy might increase the likelihood of accidents during childhood. The risk of accidental injury in patients with intellectual disabilities is double the risk in the general population, and if psychopathology or epilepsy is associated this risk is

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even higher³. Young adults with a prior history of typical absence epilepsy in childhood showed a higher risk of accidents than a disease control group of patients with juvenile rheumatoid arthritis. Most accidents happen during treatment with antiepileptic drugs (AEDs)⁵.

The risk of accidents in patients with epilepsy seems to be directly related to the seizure itself. With few exceptions, when seizure-related events are excluded, patients with epilepsy are not at any significantly higher risk of illnesses and accidents^{6,7}.

The objective of this study was to identify the frequency and type of seizure related injuries in children diagnosed with epilepsy. In addition we also assessed possible risk factors associated with this seizure related accidents in childhood.

Appendix. Questionnaire used to assess seizure related accidents and injuries.

1. Did your child ever have a seizure related accident?
() Yes () No
2. Did your child almost have a seizure related accident, which was prevented by yourself or another bystander?
() Yes () No
3. Did your child ever have a potential seizure related accident, avoided only because of luck? *
() Yes () No
4. Did your child ever need to go to the hospital due to a seizure related accident?
() Yes () No
5. What type of injury resulted from the seizure related accident?

* For example: your child crossed the street during a complex partial or absence seizure but there were no vehicles on the road at the moment.

METHOD

This study was conducted at the pediatric epilepsy clinic of our University Hospital from January 2005 to August 2006. We evaluated 100 consecutive children with diagnosis of epilepsy according to the International League Against Epilepsy¹⁰. All parents or legal guardian signed an informed consent approved by the Ethical Committee of our institution. Parents were interviewed by one of the authors using a structured questionnaire (Appendix).

We then assessed if seizure related accidents were associated with the following variables: the type of epilepsy syndrome (idiopathic or symptomatic/probable symptomatic), developmental delay, number of antiepileptic drug, neurological examination and if the child was ambulatory. Statistical analysis was performed using the Fisher exact test and Student t test, with a level of significance of 0.05.

RESULTS

From the 100 patients evaluated, 49 were girls and 51 were boys. Ages ranged from six months to 18 years old (mean=9 years). Epilepsy was idiopathic in 14 patients, symptomatic in 51, and cryptogenic in 35. Seizure related accidents were more frequent in patients with symptomatic/probable symptomatic epilepsies ($p<0.05$; Table).

Neurological examination was normal in 49 patients, and developmental delay was present in 51 patients (21 patients were not able to walk).

Thirty-four patients reported infrequent seizures, with no events in the 30 days prior to the interview. Twenty-seven patients were on carbamazepine, 13 phenytoin, 13 phenobarbital, 32 clobazam, 35 valproate, 14 lamotrigine, 10 clonazepam, eight topiramate, five oxcarbazepine, four nitrazepam, and four vigabatrine. Fifty-three patients were on polytherapy. Patients presenting with seizure related

Table. Comparison of the risk factors among the group of patients that presented seizure related accidents versus those that did not present accidents.

Variable	Patients with seizure related accidents (n=44)	Patients without accidents (n=56)	Statistical analysis
Gender	Boys=24 Girls=20	Boys=27 Girls=29	p=0.552
Age	1 year-old to 18 years-old (mean=10.3636)	6 months to 17 years-old (mean=12.1785)	p=0.534
Infrequent seizures*	14	20	p=0.831
Mean number of AED	2.04	1.33	p<0.05
Type of epileptic syndrome	Symptomatic=27 Probable symptomatic=15 Idiopathic=2	Symptomatic=24 Probable symptomatic=20 Idiopathic=12	p=0.0196 (Probable symptomatic/ symptomatic versus idiopathic)
Developmental delay	26	25	p=0.164
Able to walk without assistance	38	41	p=0.140

*Patient reporting infrequent seizures (none in the last 30 days); AED, antiepileptic drugs.

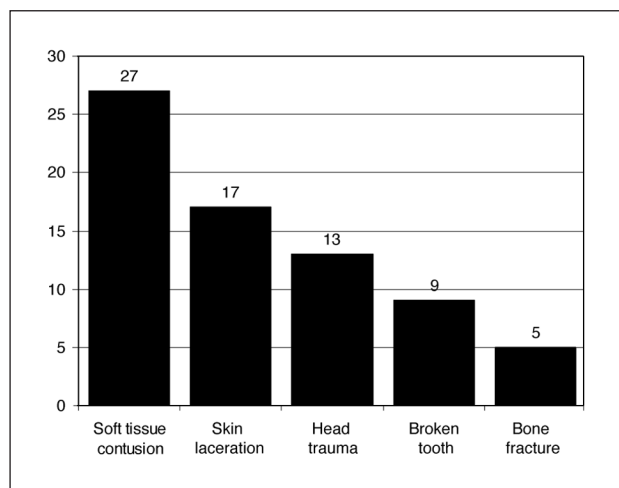


Fig 1. Type of injury produced by the seizure related accident.

accidents were on a higher number of AEDs than those in which no accidents happened ($p < 0.05$).

Forty-four patients described a seizure related accident. Eighteen patients needed medical assistance at an emergency room due to their injury from the seizure. In 40 patients a seizure related accident was prevented by a bystander. 14 patients described situations where their seizures could have caused an accident, but where this was averted by good luck. Contusions and lacerations were the most common type of lesion associated with seizures. Figure 1 shows the type of injury presented by our patients.

DISCUSSION

Our data show that 44% of the children with epilepsy had seizure related accident, and in 18% these caused injury severe enough to require a visit to the emergency room. This finding is alarming, especially because seizure related

accidents happened at an age in which children often are supervised for most of the time. This constant supervision provided by parents or caretakers prevented a seizure related accident in 40% of the patients. However, our data is limited by the fact that patients were interviewed during routine clinical visits, and the retrospective recollection of events might underestimate its frequency.

Patients with seizures are often advised to avoid high risk situations such as swimming, skydiving, climbing heights, etc. It is interesting to note that although our study was performed in a tropical country, there was no drowning or near drowning in our patients. We speculate this may be because we routinely advise the families about the risk of water related activities, such as swimming lessons or playing in a pool. This would suggest that active counseling may favorably alter outcomes. In addition, it has been shown that if the child with epilepsy is intellectually normal, seizures are well controlled with AED, and there is supervision while in the water, the risk of drowning is very small¹¹.

Seizure related accidents were more frequent in patients with symptomatic/probable symptomatic epilepsy; however, one of our patients with idiopathic epilepsy was almost hit by a car due to a seizure while he was crossing the street and another rode his bicycle into a truck during a seizure. Both patients had childhood absence epilepsy. This is in keeping with the literature, which shows that accidental injury is common in children with childhood absence epilepsy and usually occurs after AED treatment is started⁵.

Use of polytherapy is a known risk factor for seizure related accidents¹². This is in keeping with our data, which showed patients with seizure related accidents were on

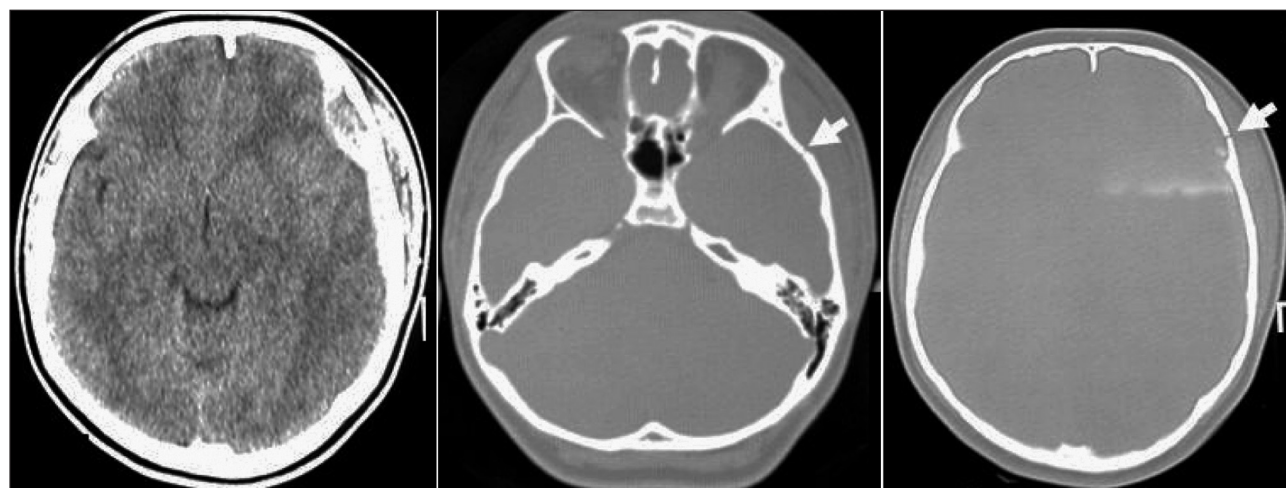


Fig 2. Computerized tomography showing a epidural hematoma and skull fracture (arrow) in a 17 year-old boy produced by a fall from a bunk bed during a seizure.

a significant higher number of AEDs. However, in contrast to a similar study performed by Lawn et al.¹², our data showed that seizure related accidents are frequent in children with epilepsy. Maybe this is due to the fact that the inclusion criteria for that study was any injury resulting from a seizure, other than orolingual trauma, sufficient for the patient to seek medical attention. We believe that patients often do not seek medical care due to mild or moderate lesions caused by seizures.

Seizure related burns are often seen in adults with epilepsy; however we did not observe burns in our group of children. This may be due to the fact that seizure related burns usually occur while cooking or showering without supervision¹³⁻¹⁵.

Our data showed no difference between the risk of seizures in children with or without developmental delay or the ability to walk without assistance. It has been reported that cognitively normal children with epilepsy do not have a higher injury rate than their peers without epilepsy; but that if consciousness is impaired in seizures, extra supervision is needed^{16,17}.

We found that 13% of the patients reported a seizure related head trauma. Although most head injury was mild, it can produce complications such as skull fracture, subdural or extradural hemorrhage¹⁸, and even mild head injury has been reported to worsen seizure control in patients with epilepsy¹⁹. One of our patients was seizure free and off AEDs for many years when he presented with a generalized tonic-clonic seizure while sleeping in a bunk bed, which resulted in a skull fracture and epidural hematoma (Fig 2).

We conclude that seizure related accidents and injuries are common in children with epilepsy. Patients with symptomatic/probable symptomatic epilepsy and on multiple AEDs are at increased risk of this type of event.

Parents and caretakers should be even more cautious about risk of injury in such patients.

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