

SIMILARITY BETWEEN FIRST SEIZURE AND RECURRENT SEIZURES IN CHILDREN

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ABSTRACT

Background: The efficacy of anticonvulsants after a first seizure is uncertain; the more predictable the time and the type of recurrent seizure, the more preventable the probable events. This study was conducted to evaluate similarity of type and time of a first seizure and its recurrence in children.

Methods: 174 children with at least two separate seizures were taken into account.

Results: Overall in 90.5% the sleep-wake state at the second seizure was the same as the first one, while the seizure type was consistent from the first seizure to the second with 95.9% being the same.

Conclusion: This information should be helpful in 1) counseling parents after their child has had a first seizure, and 2) in answering the question whether treatment should be started in a child presenting with a first epileptic seizure.

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INTRODUCTION

Following a first afebrile seizure, 25-75% of children will have another seizure.¹⁻⁵ There is controversy about the usefulness of anticonvulsant medication after a first seizure.⁶

Pellock et al. noted that systemic, behavioral, and cognitive side effects of antiepileptic drugs (AEDs) in children may be significant and that the side effects of newer AEDs are unknown. They conclude that treatment with an AED after a first seizure is not indicated for epilepsy prevention, while treatment with an AED may be considered in circumstances where the benefits of reducing the risk for a second seizure outweigh the pharmacologic and psychosocial risks.⁷

In most parts of the world, a seizure is the cause of shame or embarrassment, especially in older children. Unfortunately, the stigma of epilepsy may unfairly ex-

clude the child from social interactions or employment.⁸ Arguments in favor of treatment include the possibility of injury during a second seizure and the psychosocial consequences of a recurrent seizure in public. These two concerns are largely associated with the nature of the second seizure and whether a recurrent seizure occurs during wakefulness or sleep. Questions from our patients led to further analysis of history of patients to determine whether in a given child the wake-sleep state and the specific seizure type of a first seizure are the same at recurrence.

PATIENTS AND METHODS

Medical charts of children with two separate unprovoked afebrile seizures referring to the Pediatric Neurology Clinic of Emam Reza Hospital of Mashhad University of Medical Sciences between 1996 and 2001 were reviewed to ascertain the nature of seizure, the asleep-awake state at the time of the first seizure and first recurrent seizure.

Exclusion criteria were ambiguous episodes, all sei-

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zures occurring with an acute encephalopathy (for example, meningitis, encephalitis, or electrolyte or glucose disturbance, within 1 week of head trauma or in association with febrile illness), the presence of a brain tumor, or progressive neurologic disease. We also excluded specific seizure-types that always recur (absence, akinetic, myoclonic, infantile spasms, and other minor motor seizures).^{9,10}

RESULTS

174 children with two separate seizures had desirable conditions. Of the 174 children 99(56.9%) were male and 75(43.1%) female and aged between 7 months and 17 years. The first seizure in 82(47.1%) occurred when the children were awake, 66(37.9%) in sleep state and in 26(15%) unknown (Table I). In 91.5% (75/82) of patients with awake seizure, seizures also recurred in the wake state ($p<0.001$), while recurrence occurred in 89.4% (59/66) of patients with asleep seizures, in the sleep state, too ($p<0.001$). Overall in 90.5% the sleep-wake state of the child at the first seizure was the same at recurrence. Of those recurring after a first awake seizure only 7/82 (8.5%) were asleep at the second seizure. For those known to be asleep at the first seizure 7/66 (10.6%) of the recurrences was during the awake state.

The frequency of seizure types in this study was: GTCS(60%), CPS(14%), Rolandic (11%), PWSG(10%), and SPS(5%).

The seizure type was very consistent from the first seizure to the second, with 95.9% being the same. Table II and Table III illustrate the similarity rate of type and time of first seizure and first recurrence between different types of seizures.

DISCUSSION

This study was conducted to evaluate similarity of type and time of a first seizure and recurrence in children. Seizures may result in psychological or physical injury or even death.¹¹ As a developing being, a child is

particularly vulnerable to the psychological impact of seizures. The loss of confidence, self-esteem, and self-sufficiency that may accompany seizures or their treatment may impede psychological maturation. Convulsions or other seizures associated with sudden loss of postural control may cause fractures or lacerations.¹² The more predictable the time and the type of recurrence seizure, the more preventable the probable events; also treatment and medication would be more successful.

In this study, 174 children with at least two separate seizures were evaluated. The time of the first seizure in 47.1% was awake, in 37.9% was asleep and was unknown in 15%. Overall in 90.5% the sleep-wake state at the second seizure was the same as the first one.

Camfield et al^{9,13} found that of 168 children, 63.1% had awake seizure, 25.6% asleep and 11.3% unknown. Of those 87 children had recurrence and in 81% the wake-sleep state of the first and recurrent seizures was the same. Combining three factors (initial seizure-type, neurologic examination, and EEG results), they found a comprehensive estimate of recurrence. The best overall prognosis was seen in children with a normal neurologic examination, nonepileptiform EEG, and a first seizure that was generalized (estimated recurrence rate, 30%). Those with partial complex seizures, a focal epileptic EEG, and abnormal neurologic examination nearly always recurred (estimated recurrence rate, 96%).

Our study shows that of children with the first seizure during sleep 89.4% (60% in Camfield's study¹³) had a recurrent asleep seizure. Of those patients with the first seizure awake, 91.5% (89% in Camfield's study¹³) recurred when they were awake. Although these two findings (the statistics) are different, one common thing is noticeable: The similarity between the first and the second seizure during wakefulness is stronger.

In other words, unfortunately, the probability change from asleep to awake seizure is more in proportion to change from awake to asleep state between the first and the second seizure.

Also, in 7 patients in whom seizures changed from asleep to awake, 6 were male, but this was not statisti-

Table I. Wake-sleep state for first and recurrent seizures.

| | First seizure | Recurrent seizure | | p*chi-square (statistically significant) |
|---------|---------------|-------------------|--------------|---|
| | | Awake | Asleep | |
| Awake | 82(47.1%) | 75/82(91.5%) | 7/82(8.5%) | <0.001 |
| Asleep | 66(37.9%) | 7/66(10.6%) | 59/66(89.4%) | <0.001 |
| Unknown | 26(15%) | - | - | - |
| Total | 174 | - | - | - |

Table II. Similarity of first seizure and recurrence according to type.

| Type of seizure | Similarity rate between type of two seizures | p*chi-square (statistically significant) |
|-----------------|--|--|
| GTCS | 96.9% | = 0.0001 |
| CPS | 95.8% | = 0.0001 |
| Rolandic | 94.7% | = 0.0001 |
| PWSG | 94.4% | = 0.0001 |
| SPS | 100% | < 0.0001 |

Table III. Similarity of first seizure and recurrence according to time.

| Type of seizure | Similarity rate between time of two seizures | p*chi-square (statistically significant) |
|-----------------|--|--|
| GTCS | 88.7 % | = 0.0001 |
| CPS | 90.9% | = 0.0001 |
| Rolandic | 94.4% | = 0.0001 |
| PWSG | 87.5% | = 0.0001 |
| SPS | 100% | < 0.0001 |

GTCS: Generalized tonic clonic seizure

CPS: Complex partial seizure

PWSG: Partial with secondary generalization

SPS: Simple partial seizure

cally significant ($p=0.07$).

In this study, the seizure type is consistent from the first seizure to the second with 95.9% being the same (95.4% in Camfield's study).¹³

This information should be helpful in counseling parents after their child has had a first seizure. The chance of injury is minimal during a seizure in bed. Probably the psychosocial consequences of a nocturnal seizure are less than those of a daytime seizure. Unfortunately, a first sleep seizure will not reliably be followed by a second sleep seizure, and therefore the child's daytime caretakers and school need to be informed.

Anxiety about where a recurrent seizure might occur following a first daytime seizure must be addressed, since a recurrence will almost certainly be in the awake state.

Our study, similar to Camfield's study¹³ shows that the seizure type remains constant and the results can reassure those patients whose first seizure did not impair consciousness. But for the child whose first seizure has impaired consciousness, caretakers need to be informed.

CONCLUSION

Even though the effect of anticonvulsants after a

first seizure is unclear.^{8,14} It is possible that the type and time of a first seizure would help us in the decision of whether to treat or not.

REFERENCES

1. Hirtz D, Berg A, Bettis D, Camfield P, Crumrine P, Gaillard WD, Schneider S, Shinnar S: Treatment of the child with a first unprovoked seizure. *Neurology* 60: 166-175, 2003.
2. Shinnar S, Berg AT, Ptachewich Y, Alemany M: Sleep state and the risk of seizure recurrence following a first unprovoked seizure in childhood. *Neurology* 43(4): 701-6, 1993.
3. Hirtz DG, Ellenberg JH, Nelson KB: The risk of recurrence of nonfebrile seizures in children. *Neurology* 34: 637-41, 1984.
4. Stroink H, Brouwer OF, Arts WF, Geerts AT, Boudewyn peters AC, Van donselaar CA: The first unprovoked, untreated seizure in childhood: a hospital based study of the accuracy of the diagnosis, rate of recurrence, and long term outcome after recurrence. *Dutch study of epilepsy in childhood. J Neurol Neurosurg Psychiatry* 64: 595-600, 1998.
5. Shinnar S, Berg AT, Moshe SL, Petix M, Maytal J, Kang H, Goldensohn ES, Hauser WA: Risk of seizure recurrence following a first unprovoked seizure in childhood. *Pediat-*

- rics 85(6): 1076-85, 1990.
6. Hirtz D, Berg A, Bettis D, Camfield C, Camfield P, Crumrine P, Gaillard WD, Schneider S, Shinnar S: Quality Standards Subcommittee of the American Academy of Neurology; Practice Committee of the Child Neurology Society. Practice Parameter: Treatment of the child with a first unprovoked seizure: Report of the quality standards subcommittee of the American Academy of Neurology and the Practice Committee of the Child Neurology Society. *Neurology* 28; 60(2): 166-75, 2003.
7. Pellock JM: Whether and how to treat first unprovoked childhood seizure. *Journal Watch Neurology* (327): 1-1 March 27, 2003.
8. Medical Research Council Antiepileptic Drug Withdrawal Study Group: Randomized study of antiepileptic drug withdrawal in patients in remission. *Lancet* 337: 1175-1180, 2003.
9. Camfield PR, Camfield CS, Dooley JM, Tibbles JAR, Fung T, Garner JB: Epilepsy after a first unprovoked seizure in childhood. *Neurology* 35: 1657-1660, 1985.
10. Greenwood RS, Tennison MB: When to start and stop anticonvulsant therapy in children. *Arch Neurol* 56: 1073-1077, 1999.
11. Camfield CS, Camfield PR, Veugelers PJ: Death in children with epilepsy: a population-based study. *Lancet* 1; 359 (9321): 1891-5, 2002.
12. Baker GA, Nashef L, Van Hout BA: Current issues in the management of epilepsy: The impact of frequent seizures on cost of illness, quality of life, and mortality. *Epilepsia* 38(suppl 1): S1-S8, 1997.
13. Camfield PR, Camfield CS: Similarity of first seizure and first recurrence in children. *Neurology* 37:1429, August 1987.
14. First Seizure Trial Group: Randomized clinical trial on the efficacy of antiepileptic drugs in reducing the risk of relapse after a first unprovoked tonic-clonic seizure. *Neurology* 43:478-483, 1993.