

# 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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**Keywords:** Seizure, Recurrence, children.

## INTRODUCTION

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

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.<sup>7</sup>

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.<sup>8</sup> 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).<sup>9,10</sup>

**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.<sup>11</sup> 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.<sup>12</sup> 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<sup>9,13</sup> 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 study<sup>13</sup>) had a recurrent asleep seizure. Of those patients with the first seizure awake, 91.5% (89% in Camfield's study<sup>13</sup>) 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).<sup>13</sup>

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 study<sup>13</sup> 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.<sup>8,14</sup> It is possible that the type and time of a first seizure would help us in the decision of whether to treat or not.

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