Recurrence of First Fits

After diagnosis of first Fits, naturally the following questions pop in the mind of clinician; “what is the risk of recurrence?” and “ Does my patient need treatment?” the information below may provide some useful insight to answer these questions with open eyes!

- After a single tonic-clonic seizure, recurrence rates vary from 15% to 60%, depending on several risk factors*.
- After two tonic-clonic seizures, the risk of a third seizure is about 85%.

<u>*Risk Factors</u>

- A family history of seizure
- Age younger than 16 years
- A spike-and-wave pattern on the EEG (presence of epileptiform abnormalities on the EEG)
- A history of prior neurologic insult increase the risk of recurrence after a first unprovoked seizure.
- Todd's paralysis
- Status epilepticus, multiple episodes of fits within 24 hours
- Acute symptomatic seizures occurring immediately after brain insult, such as head trauma, or stroke
- Detection of focal abnormalities on neurologic examination or imaging studies
- Patients seen within the first 24 hours have a higher recurrence rate than those who undergo evaluation 2 to 3 weeks after a seizure!
- Seizures between mid night and 8:59AM!
- Neurologic deficit at birth (ie; Cerebral Palsy, or mental retardation)
- Previous provoked seizures

Epileptic patients are likely to experience a second seizure within 6 months after the first attack.

Many prospective and retrospective studies have evaluated the risk of recurrence after a first seizure.

Musicco, 1993 the cumulative 2-year risk of seizure recurrence was 51%.

Hopkins and colleagues, found a 3-year risk of 52%.

After a single unprovoked seizure, the chance of a second seizure (ie, likelihood of going on to develop epilepsy) is approximately 30-60%. The patient with a single seizure who has returned to baseline does not need to be started on an antiepileptic drug in the ED. Treatment does lower the rate of recurrence, but patients who would not have had a recurrent seizure are subjected needlessly to the potential toxicity of these medications. Recurrence is more likely in those with a history of significant head injury or other CNS insult. If the patient has a normal MRI and EEG, the likelihood of a second seizure is approximately 1 in 3; if either test result is abnormal, the chances are approximately 1 in 2; if both are abnormal, the probability rises to 2 in 3 (Berg and Shinnar, 1991).

<u>Pathology in seizures (interactable)</u>

The risk of developing seizures from a structural lesion depends on a wide variety of factors:

- Lesion type

- Lesion location
- Involvement of cortical gray matter

In general, slow growing primary neoplasms of the brain tend to be associated with the highest risk of seizures.

Type of brain lesions with Seizures as the primary presenting symptom

- Gangliogliomas 80-90% of cases
- Dysembryoplastic neuro-epithelial tumors (DNET's) and pilocytic astrocytomas are also associated with a high incidence of intractable epilepsy.
- More aggressive, rapidly growing tumors such as glioblastoma multiforme (GBM) and cerebral metastases are associated with a lower risk of seizures in the range of 20 to 30%.
- Oligodendrogliomas which may be either very slow growing and indolent or have more anaplastic features are classically associated with epilepsy in 50-75% of cases with a lower incidence in the more aggressive tumors and older patients.
- Supratentorial meningiomas are associated with about a 50% risk of seizures although they tend to be less refractory to medical therapy
- Arteriovenous malformations (AVMs) have also been associated with a risk of seizures in the 30 - 35%
- Cavernous angiomas present with seizures in 39 - 55% of cases and are often refractory to medical management.
- Venous angiomas have small risk of seizures and estimated to be about 5%.
- Cerebral vascular disease resulting in stroke or intracranial hemorrhage represents an important cause of seizures especially in the elderly.
- Cerebral infarction in the older population (> 50 years of age) has been found to be the cause of new-onset seizures in approximately 20% of cases.
- Subarachnoid hemorrhage may cause Seizures in 10 - 20% of cases and are probably more common in patients that harbor a peri-sylvian or temporal lobe hematoma
- Intracerebral hematomas, especially of the lobar type, are associated with seizures in about 28% of cases whereas deep basal ganglia hematomas have a much lower incidence.
- Craniocerebral trauma has also been associated with approximately a 20% risk of post-traumatic epilepsy.
- Diffuse closed head injury has a lower incidence than compound fractures or penetrating cerebral injury or closed head injury associated with intracranial hematomas.

APPENDIX

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

Hans Stroink,[a] Oebele F Brouwer,[b] Willem Frans Arts,[d] Ada T Geerts,[c] A C Boudewyn Peters,[e] Cees A van Donselaar[a]

[a] Department of Neurology, University Hospital Rotterdam-Sophia Children's Hospital, Rotterdam The Netherlands, [b] Department of Neurology, Leiden University Medical Centre, Leiden, The Netherlands,

[c] Department of Public Health, Erasmus University, Rotterdam, The Netherlands, [d] Department of Neurology, Westeinde Hospital and Juliana Children's Hospital, The Hague, The Netherlands, [e] Department of Child Neurology, University Hospital Utrecht and Wilhelmina Children's Hospital, Utrecht, The Netherlands

Correspondence to: Dr H Stroink, Department of Neurology, University Hospital Rotterdam-Sophia Children's Hospital, PO Box 2060, 3000 CB Rotterdam, The Netherlands.

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OBJECTIVE—To assess the accuracy of the diagnosis of a first unprovoked seizure in childhood, the recurrence rate within two years, the risk factors for recurrence, and the long term outcome two years after recurrence.
METHODS— One hundred and fifty six children aged 1 month to 16 years after a first seizure, and 51 children with a single disputable event were followed up. The diagnosis of a seizure was confirmed by a panel of three child neurologists on the basis of predescribed diagnostic criteria. None of the children was treated after the first episode.
RESULTS—Five children with a disputable event developed epileptic seizures during follow up. The diagnosis did not have to be revised in any of the 156 children with a first seizure. The overall recurrence rate after two years was 54%. Significant risk factors were an epileptiform EEG (recurrence rate 71%) and remote symptomatic aetiology and/or mental retardation (recurrence rate 74%). For the 85 children with one or more recurrences, terminal remission irrespective of treatment two years after the first recurrence was >12 months in 50 (59%), <six months in 22 (26%), and six to 12 months in 11 (13%) and unknown in two (2%). Taking the no recurrence and recurrence groups together, a terminal remission of at least 12 months was present in 121 out of the 156 children (78%).
CONCLUSIONS—The diagnosis of a first seizure can be made accurately with the help of strict diagnostic criteria. The use of these criteria may have contributed to the rather high risk of recurrence in this series. However, the overall prognosis for a child presenting with a single seizure is excellent, even if treatment with antiepileptic drugs is not immediately instituted.

Keywords: first seizure; epilepsy; prognosis

- Risk factors for recurrent seizures include the following:
  - Age younger than 16 years: Musicco et al found that children younger than 16 years had almost double the risk of recurrent seizures as adolescents and adults aged 16-60 years.
  - Remote symptomatic seizure (Annegers, 1986; Hauser, 1990; Berg, 1991): In the case of seizures after a first stroke, Labovitz et al found that lesion location and stroke subtype are strong predictors of early seizure risk, and early seizures are a predictor of recurrent seizures (Labovitz, 2001).
  - Seizures occurring between midnight and 8:59 am (Hopkins, 1988; Martinovic, 1997; Bora, 1995)
  - Prior provoked seizures (Hauser, 1990)
  - Remote symptomatic seizure in a patient whose sibling is affected with epilepsy (Hauser, 1990)
  - Status epilepticus or multiple seizures within 24 hours as the initial remote symptomatic seizure (Hauser, 1990)
  - Partial seizures (Annegers, 1986; Berg, 1991)
  - Todd paralysis in patients with a remote symptomatic seizure (Hauser, 1990)
  - History of neurologic deficit from birth such as cerebral palsy or mental retardation (Annegers, 1986)
  - Abnormal examination findings in patients without a remote symptomatic seizure (Annegers, 1986; Camfield, 1985)
  - CT scan that shows a brain tumor (Hopkins, 1988)
  - EEG that shows epileptiform discharges
    - In patients with a first seizure and no known etiology, van Donselaar obtained a routine EEG in all cases and a second sleep-deprived EEG if the first EEG did not show epileptiform discharges. His pooled results showed the following 2-year cumulative risks of seizure recurrence: in patients with epileptiform discharges, 83%; in patients with nonepileptiform abnormalities, 41%; and in patients with normal EEGs, 12% (van Donselaar, 1992).
    - In 1997, Beghi et al found that epileptiform discharges were associated with a 1.5- to 3-fold increase in the risk of seizure recurrence.

        - In 1993, Musicco et al found that epileptiform discharges were associated with a 1.7-fold increased seizure recurrence risk.
        - Berg and Shinnar found that epileptiform discharges were associated with a 2-fold increased seizure recurrence risk (Berg, 1991).
        - In 1990, Hauser et al found that generalized spike and wave increased the risk of recurrent seizure in patients with no known etiology.
        - In 1997, Beghi et al found that an abnormal EEG finding and the presence of an underlying etiology (remote symptomatic) are the most consistent predictors of recurrence.
- Immediate anticonvulsant treatment reduces the likelihood of a second seizure by half (Musicco, 1993). According to a 1993 report, Chandra found that valproate treatment reduced seizure recurrence rates from 63% to 4.3%.
- Immediate anticonvulsant therapy does not affect the long-term prognosis for achieving 1- or 2-year seizure-free remission and exposes many patients who would never have a recurrent seizure to anticonvulsant side effects (Musicco, 1997).
- The need for anticonvulsant treatment after two seizures is generally agreed upon. The decision to provide anticonvulsant treatment after one seizure should be individualized.
    - Two situations that are often encountered in clinical practice and should be distinguished are a first seizure and new-onset epilepsy with more than one unprovoked seizure. Berg and Shinnar emphasized the need to distinguish between these two entities in clinical studies (Berg, 1991).
    - Seizure recurrence risk is substantially higher after two or more unprovoked seizures than after just one (Hauser, 1990).

Hauser and associates1990, reported a 5-year recurrence risk of 34% They also found that variability in the reported risks of seizure recurrence may have been due to the following:

- Variations in patient populations: Some studies reflect the risk in referral populations; other studies reflect the risk in a more general patient population.
- Variations in the specificity and sensitivity of case definitions
- Misclassification of cases: Hauser et al found that 74% of the patient cohort required exclusion because of a previous unprovoked seizure.
- Variations in time of ascertainment
- Biases from retrospective study design
- Confounding effect of anticonvulsant treatment: Many of the previous studies included patients who received anticonvulsant therapy after their first seizure.