Is routine EEG helpful in the management of complex febrile seizures?

Report by
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doi: 10.1136/adc.2003.048447

A previously healthy 16 month old girl attends with the first episode of a complex febrile seizure (prolonged more than 15 minutes). She is neurologically normal, and examination reveals otitis media as the source of her fever. According to local protocol, her evaluation includes an EEG. One cannot but wonder as to the value of this routine practice.

Structured clinical question

In a 16 month old neurologically healthy girl [patient] with the first episode of a complex febrile seizure [risk factor] what is the probability of abnormalities after postictal EEG [outcome]?

Search strategy and outcome

Secondary sources—nil.

Search strategy—''(febrile, seizures, complex)'' [MeSH] AND ''EEG''.

Search results—68 individual articles found, one relevant. See table 3.

Commentary

A febrile seizure is defined as a seizure accompanied by fever without central nervous system infection. Complex febrile seizures, also called atypical or complicated, were defined as focal, prolonged more than 15 minutes, or repetitive.

The purpose of an EEG in the evaluation of complex febrile seizures is to help identify the nature of underlying acute or remote cerebral pathology and predict the risk of future afebrile seizures; no published study has shown that early EEG after a first episode of febrile seizures in postictal neurologically normal children will predict the occurrence of afebrile seizures.

Studies that investigate the relations of signs or symptoms with EEG abnormalities or between clinical subgroups of complex febrile seizures, for example, focal, prolonged or recurrent, have not been found.

Only one small and non-independently validated descriptive report with 33 patients has specifically answered the question (Maytal *et al*). This study addressed the value of an early postictal sleep EEG to detect the prevalence of abnormalities in neurologically normal children with the first complex febrile seizures, up to one week after the seizure. The study was retrospective and did not indicate whether EEGs were repeated over a follow up period. Twenty four patients were qualified as complex cases based on one factor (prolonged in nine, repetitive in 13, and focal in two). Nine other patients had two complex factors (in six the seizures were long and repetitive, in two focal and repetitive, and in one the seizures were long, focal, and repetitive), which reduced the actual useful number of patients comparable to our patients in a clinical scenario.

The study was uncontrolled and included only neurologically normal children. Maytal and colleagues made no differences between complex febrile seizure clinical subgroups. An important number of patients experienced prior febrile seizures; not all patients were therefore assembled at a common point in the course of the disease.

The rate of abnormalities after an early postictal EEG in these patients was low and similar to the reported rate of abnormalities in children with simple febrile seizures, a fact that could be confirmed on a larger number of patients.

EEG should be considered in all children with complex febrile seizures who recur with afebrile convulsions, or in those children who recur with febrile seizures and exhibit developmental delays or abnormal neurological signs and symptoms.

CLINICAL BOTTOM LINE

- Abnormal EEG was uncommon in children with complex febrile seizures (95% probability less than 8.6%).
- The current local practice of EEG in neurologically normal children with complex febrile seizures does not appear to be evidence based. There is some limited evidence to suggest that it may not be useful.

REFERENCES

Maytal J, Steel R, Eviatar L, *et al*. The value of early postictal EEG in children with complex febrile seizures. *Epilepsia* 2000;**41**:219–21.
Hanley JA, Lippman-Hand A. If nothing goes wrong, is everything all right? Interpreting zero numerators. *JAMA* 1983;**249**:1743–5.

Table 3 EEG in the management of complex febrile seizures

Citation	Study group	Study type (level of evidence)	Outcome	Key results	Comments
Maytal *et al* (2000)	33 patients with complex febrile seizures. Mean age 17.8 months. Neurologically normal children	Retrospective chart review (level 4)	EEG	100% normal (95% CI 89.6–100)	Thirteen (39%) patients experienced prior febrile seizures

An update to ''Inhaled steroids in the treatment of mild to moderate persistent asthma in children: once or twice daily administration?'' (*Arch Dis Child* 2002;**87**:415–16) has been posted online at http://www.archdischild.com/supplemental.