

Confusional Migraine or Photoepilepsy?

Case History and Follow-up Submitted by Randolph W. Evans, MD

Expert Opinion by Jack Gladstein, MD

Q1 **Key words:**

(Headache. 2003;43:000-000)

In some children, it can be difficult to distinguish confusional migraine from epilepsy. In this case, the “television provocation test” confirmed the diagnosis.

CLINICAL HISTORY

A 12-year-old boy reported a history of migraine “all of my life.” He described attacks of nonlateralized throbbing pain associated with light and noise sensitivity that could occur as often as once every 1 to 2 weeks or desist for months. The headache and lasted 1 to 4 hours. Weather change was the only trigger he could identify.

Seven months previously, while he was watching television in the afternoon, his mother reported that for about 30 minutes he behaved oddly. He would not talk but did respond slowly to requests. He either stood in front of the television or sat on the bed with his arm around his dog. After 30 minutes, he appeared normal and had no recollection of the episode. He reported severe occipital headache with nausea, vomiting, and light sensitivity that lasted about 4 hours. His mother has migraine, but there is no family history of epilepsy.

Neurologic examination was normal. A magnetic resonance imaging (MRI) scan of the brain was normal. The electroencephalogram (EEG) was normal except for photic stimulation; with stimulation at frequencies ranging from 11 to 17 Hz, there were gener-

alized bursts of 3 to 4 Hz spike and slow wave activity. The patient stated that he felt “funny” during the photic stimulation.

Seven months later, he presented again after a seizure. He had underslept the night before. In the morning, he was playing a video game and using the television set as the monitor, when, without an aura, he passed out and was observed by his friend to “twitch” all over. The episode lasted about 2 to 3 minutes. Afterward, he was confused and sleepy and complained of a severe headache for several hours. Neurologic examination was normal.

Questions.—Was the first episode more likely an episode of confusional migraine or a seizure? Is epilepsy in general, and photoepilepsy in particular, more common in children and adolescents with migraine? What treatment would you recommend?

EXPERT COMMENTARY

Before addressing the details of this case, I want to thank Dr. Evans for assigning me a case with twists and turns that required I relearn some of the EEG literature that I haven’t reviewed in quite a while. As one who treats pediatric headache and instructs others in its management, I teach that the EEG typically has a limited role. In this case, however, the EEG is key to diagnosis. Upon initial consideration, the first episode was strongly suggestive of migraine, while the second episode was clearly a seizure. I maintain that the second episode did shed new light on the first, forcing us to reconsider the initial diagnosis of migraine. Using the retrospectroscope, I hope to piece together why both episodes are related. One

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of the most basic and useful rules of diagnosis is “try to unify with one diagnosis, since a patient is unlikely to have two rare conditions.” With that guiding rule in mind, I will first review acute confusional migraine and then contrast that condition with photoepilepsy. Let’s start with the case itself.

We first learn of this 12-year-old’s history of migraine without aura. The history is convincing. He experiences pulsatile head pain, photophobia and phonophobia, extended headache-free intervals, and just the right headache duration for a youngster (note that Winner et al recommends that the International Headache Society (IHS) criteria for duration be extended down to 1 hour in children¹). We move on to the first event. For 30 minutes while watching television he was partially unresponsive, and this immediately was followed by a nasty headache. An MRI was normal and an EEG was normal except during photic stimulation.

Let’s review acute confusional migraine and see if that diagnosis fits up to this point. Living first described migraine presenting with alternations of consciousness in 1873.² Gascon and Barlow coined the phrase “acute confusional migraine” in 1970.³ Agitation, visual changes, and word-finding difficulties often accompany the confusional state. Episodes may occur spontaneously or after mild head trauma. The confusional period lasts for a few hours and is preceded or followed by a typical migraine attack with headache and autonomic features. As with our youngster, there is usually a history of previous “typical” migraine attacks or subsequent migraine without the confusional state. As with this case, it is incumbent upon the practitioner to rule out more serious causes of mental status changes, rendering acute confusional migraine a diagnosis of exclusion. Electroencephalography typically demonstrates frontal intermittent rhythmic delta activity (FIRDA). Immediately after the episode, some patients’ EEGs show global slowing. The EEG returns to normal within 1 to 3 days. So, at first glance, this youngster had acute confusional migraine, with an EEG more or less to match.

Seven months after this episode, he had an overt tonic-clonic seizure with a postictal period replete with sleepiness and severe headache. Both episodes occurred in front of the television. The first episode oc-

curred while watching a program, while the second happened while playing a video game. In retrospect, was his abnormal EEG related to both of these events?

Photosensitivity is defined by the occurrence of spikes or spikes and waves in response to intermittent light stimulation.⁴ There are 4 patterns of photosensitivity, and 1 specific pattern has been associated with subsequent epilepsy. This pattern is characterized by generalized spike and wave activity at 3 Hz that persists for at least 100 milliseconds after the cessation of the stimulus. Bickford and colleagues named this pattern the photoconvulsive response, and it typically occurs at light flash frequencies from 5 to 60 Hz.⁵ It occurs in 1 in 4000 children and is more common in females. Our patient’s EEG fits that pattern and implies that he is more likely to experience seizures. Does having this predilection to epilepsy manifest itself by seizures that occur while watching television or playing video games? Binnie et al performed EEGs on a group of 10 youngsters with epilepsy who had a history of the photoconvulsive response on EEG. Nine of 10 reproduced their pattern during television watching.⁶ What about video games? Rush-ton first described a seizure caused by video games, and by 1993, 27 patients were reported in the literature.⁷ Most consider this association to be an extension of photosensitive epilepsy.⁸ In contrast to television-induced epilepsy, there is 4.7:1 male predominance, likely related to the overwhelming use of video games by males. Other precipitants of photosensitive epilepsy include staring at black-and-white-patterned floor tiles, striped-colored clothing, or moving escalators, or focusing on telephone poles or trees while riding in a vehicle.⁹

There are classic reviews in the literature showing that there is increased incidence of migraine in patients with epilepsy and of epilepsy in migraineurs.¹⁰⁻¹² I was unable, however, to find literature indicating a higher incidence of migraine in patients with photoepilepsy.

I hope I have convinced you that this youngster had two events that were induced by his television set. His abnormal initial EEG was the clue that he was photosensitive. I would recommend that he begin divalproex sodium. I would also recommend limiting his exposure to video games and television (a good idea for all youngsters). If he must watch televi-

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sion or play video games, he should sit far away from the television, have alternate light in the room, and not play when tired or stressed. He should perhaps consider closing one eye while playing.

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FOLLOW-UP

The patient was advised to watch television or play video games only in a well-lit room and not to sit too close to the television set. He was started on Depakote. On follow-up 1 year later, he has had no further migraines or seizures.

Queries

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- Q1: Provide up to six key words that represent the key topics presented in this article.
- Q2: **Dr. Evans:** Please provide missing word(s) “The headache and ____ lasted . . .”
- Q3: **Dr. Gladstein:** Gascon vs. Gascon in reference list.
- Q4: **Dr. Gladstein:** Is this an abstract?
- Q5: **Dr. Gladstein:** Is this an abstract? If not, provide ending page number.

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