

Chapter 15

Starting Antiepileptic Drugs

Kristen Marie Kathryn Kelly and Gregory D. Cascino

Case Presentation

A 44-year-old male experienced a single, unprovoked, generalized tonic–clonic seizure at 5:30 a.m. The seizure duration was approximately 2 min with gradual recovery following a postictal state. There was no prior history of seizures or predisposing neurological conditions or comorbidity. The only risk factor for epilepsy included a concussion as a child while playing sports. Additionally, the patient did have a sibling with childhood absence epilepsy. The patient was not on prescription medication at the time of the seizure. There was no history of alcohol abuse or illicit drug use. At the time, he was employed, operated a motor vehicle, and was married with two children. Upon evaluation in the emergency department, a CT of the head was normal. An EEG performed several hours after the seizure showed bitemporal independent sharp waves (Fig. 15.1). Other than complaining of a mild headache, myalgias, and a “sore tongue” the patient appeared to be doing well at the time of dismissal from the emergency department. An MRI head was subsequently performed and was unremarkable.

K.M.K. Kelly, M.D.
Department of Neurology, Mayo Clinic, 200 First Street SW,
Rochester, MN 55905, USA
e-mail: kelly.kristen@mayo.edu

G.D. Cascino, M.D. (✉)
Division of Epilepsy, Mayo Clinic,
200 First St SW, Rochester, MN, USA
e-mail: gcascino@mayo.edu

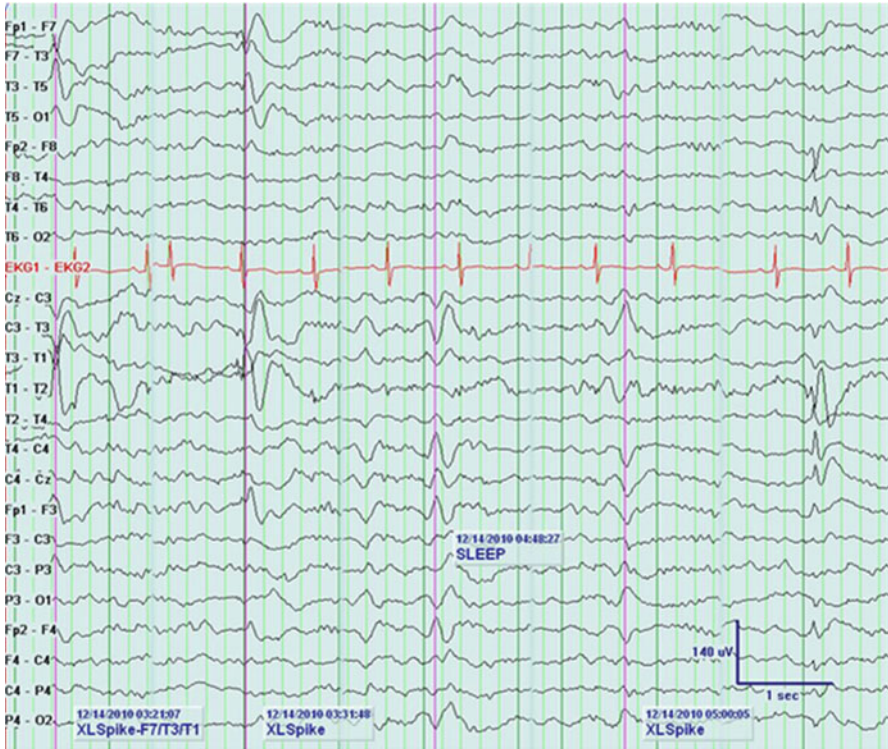


Fig. 15.1 EEG demonstrating independent bitemporal epileptiform discharges. Parameters of recording include sensitivity of $7 \mu\text{V}/\text{mm}$; display speed $30 \text{ mm}/\text{s}$; and filter settings of $1\text{--}70 \text{ Hz}$

Clinical Questions

1. What is the likelihood of seizure recurrence?
2. What clinical risk factors increase the chance of recurrence?
3. What is the anticipated clinical course?
4. What should the patient do about driving?
5. What is the best course of treatment?

Diagnostic Discussion

1. Clinical studies have shown that the risk of seizure recurrence is $30\text{--}50 \%$ at 2 years after a single unprovoked seizure. The likelihood of a second seizure is greatest in the initial 3 months following the seizure. The risk of a third seizure is approximately 65% after a second seizure.

2. Clinical factors that *may* increase the risk of recurrent seizures include a preexisting neurological disorder, a focal neurological deficit, a history of remote symptomatic neurological disease, and a positive family history for epilepsy. An abnormal EEG recording with an epileptiform discharge and a lesion on neuroimaging are risk factors that carry a high likelihood of seizure recurrence.
3. The use of antiepileptic drug (AED) therapy to reduce seizure recurrence after a single unprovoked seizure needs to be individualized. AED medication has been shown in clinical studies to reduce the risk of seizure recurrence during short-term follow-up. However, there is no evidence that the use of AED therapy after a single seizure improves long-term seizure control in patients who develop a seizure disorder. The potential benefit of AED therapy needs to be contrasted with the potential adverse effects of medication. Important issues in patients who consider AED medication are the duration of therapy and the need for drug level monitoring. Patient compliance with medical therapy should also be considered in making a treatment decision (see response 5).
4. The laws regarding driving and epilepsy are determined by each state. Many of the restrictions are limited to patients with seizure disorders or epilepsy. The “seizure-free” duration period may range from 3 months to 1 year. Most states require self-reporting by patients. Medical forms may need to be completed prior to the individual being permitted to operate a motor vehicle. The patient should discuss the issue with the health care provider and review the individual state laws.
5. The clinical course is variable in patients who present with a single unprovoked seizure. Conditions where treatment may be warranted include a prolonged focal seizure or status epilepticus, the presence of an immediate family history, a neurological deficit, an abnormal MRI or EEG, and a remote seizure. From an individual patient perspective, those with high-risk jobs or an individual inability to accept a second seizure may warrant considering treatment. The occurrence of a second seizure would usually warrant AED therapy and careful monitoring of the patient. Approximately 80 % of patients with a seizure disorder have a favorable outcome with AED medication and nearly two-thirds of patients are rendered seizure free (see response 3).

Clinical Pearls

1. Single unprovoked seizures are very common and may not always indicate the onset of a seizure disorder (epilepsy). Most individuals will have recurrent seizures during the first year following the unprovoked seizure, with the highest risk being in the initial 3 months.
2. The use of AED therapy remains controversial for patients with a single unprovoked seizure. Selected patients may be considered for AED therapy. The evidence does not permit determination for the length or the dosing of AED therapy. Patients with a single unprovoked seizure should not be “over-treated” and may not need to have a “therapeutic” drug level to remain seizure free. A thoughtful

discussion with the patient about treatment should be performed prior to making a decision regarding the institution of AED medication.

3. As a general rule, the longer the patient remains seizure free after a single unprovoked seizure, the less likely there will be seizure recurrence. However, these individuals probably have a higher seizure tendency and should modulate behavior to try and avoid proconvulsant activities. Potentially, prolonged sleep deprivation, excess alcohol use, and illicit drug use may reduce the seizure threshold.
4. An abnormal EEG recording always needs to be interpreted in light of the clinical course for the patient. If the patient has a seizure, obtaining an EEG early the same day of the seizure may have a higher yield for demonstrating an abnormality. Epileptiform discharges when present support the clinical diagnosis of a seizure. In our patient, the bitemporal sharp waves support the diagnosis of a focal seizure.

Bibliography

1. Hauser WA, Rich SS, Lee JR, Annegers JF, Anderson VE. Risk of recurrent seizures after two unprovoked seizures. *N Engl J Med.* 1998;338(7):429–34.
2. Berg AT. Risk of recurrence after a first unprovoked seizure. *Epilepsia.* 2008;49 Suppl 1:13–8.
3. Wiebe S, Tellez-Zenteno JF, Shapiro M. An evidence-based approach to the first seizure. *Epilepsia.* 2008;49 Suppl 1:50–7.