Treatment of Parenchymal Neurocysticercosis

Case Presentation: Inpatient Neurology Consultation

A 29-year-old woman with no significant past medical history presents to the emergency department with a first-time seizure.

The patient had been in her usual state of health since moving to the United States from Peru about 6 months ago. Earlier in the day, she experienced a sudden onset of dizziness followed by a loss of consciousness. The patient cannot remember any further details of the incident prior to her arrival at the emergency department. According to descriptions provided by witnesses of the event, the young woman may have had a generalized tonic–clonic seizure that lasted 3 minutes. The seizure was associated with tongue biting and post-event confusion. She was clearing to her baseline by the time she had arrived at the emergency department 20 minutes later. She was admitted to the medical wards for further management. She never had any seizures or syncopal episodes in the past. She denies any recent illnesses or medication changes. There has been no visual blurring, headaches, double vision, rash, hearing loss, weight loss, night sweats, fevers, numbness, or weakness.

Her past medical history is unremarkable. Her past surgical history includes an appendectomy in childhood. Otherwise, she has no chronic medical illnesses.

She does not take any medicines regularly.

She has no known drug allergies.

She does not smoke, drink alcohol, or use illicit substances. She works as an engineer.

There is no family history of neurologic diseases, including epilepsy.

In addition to what is noted above, a complete 14-topic review of systems was obtained and documented. Pertinent negatives are mentioned in the history above.

On physical examination, she is a well-developed and well-nourished female in no distress. She is afebrile. Her blood pressure is 108/70, pulse is 72, and respiratory rate is 12.

No bruits are heard over her neck. There are no murmurs or abnormal heart sounds. There is no rash or vesicles over her face or ears.

She is alert and oriented to person, place, and date. Registration and 5-minute recall are normal. She follows commands and names and repeats without difficulty. Her speech is fluent.

Cranial nerve testing reveals pupils are equal in size and respond to light; optic discs are sharp, visual fields are full to confrontation, and extraocular muscles are intact. Facial sensation and strength are normal. Hearing is intact bilaterally to finger rub. Palate, tongue, and uvula are midline. Shoulder shrug strength is normal.

Motor strength is MRC grade 5/5 throughout. There is no pronator drift. Tone is normal in the arms and legs.

Sensory examination shows normal pinprick, temperature, vibratory and proprioceptive perception in her extremities.

Reflexes are 2/4 in the arms and legs. Plantar responses are flexor bilaterally.

Coordination is normal on finger–nose–finger and heel–knee–shin testing bilaterally.

Her gait is narrow-based and steady.

The patient has had lab work done which shows normal chemistries and complete blood count. Her urine pregnancy test is negative. Her EKG shows normal sinus rhythm.

Her noncontrast head CT and follow-up brain MRI show bilateral parenchymal abnormalities consistent with neurocysticercosis. There are both viable cystic lesions and more chronic, calcified lesions.

You discuss with the patient that her seizure was caused by a CNS infection from a parasite called *Taenia solium*. You further explain that the CNS infection is also known as neurocysticercosis and developed from her having ingested the parasite. As her imaging shows viable cystic lesions, you recommend treatment with albendazole and dexamethasone. You advise her that the recent American Academy of Neurology (AAN) evidenced-based guideline "Treatment of Parenchymal Neurocysticercosis"[1] suggests that this combination be used to reduce both the number of active lesions on imaging and long-term seizure frequency. Furthermore, she will be started on an antiepileptic drug (AED) to reduce the risk of further seizures. You discuss the side-effect profile of all these medications. You also advise the patient about your state-specific seizure driving restrictions.

You arrange for a post-hospital follow-up for the patient in your neurology clinic as well.

Questions

1. Which of the following is the most common preventable cause of epilepsy in the world?

A. Infection with *Plasmodium falciparum*
B. Infection with *Taenia solium*
C. Automobile accidents
D. Football-related injuries
E. Stroke

The correct answer is B.

2. In the patient with intraparenchymal neurocysticercosis, which of the following is true?

A. Corticosteroids are a necessary part of treatment.
B. Anticysticidal therapy is not recommended, as there is a risk of inflammation and edema, and the parasite will eventually die on its own.
C. Albendazole is probably safe and effective in reducing the number of cysts and long-term seizure frequency in adults and children with neurocysticercosis.
D. Antiepileptic therapy is recommended regardless of whether the patient has had a seizure, as this is an epileptogenic focus.

The correct answer is C.

3. Infection with *Taenia solium* is acquired through which of the following?

A. Eating undercooked meat
B. Swimming in freshwater lakes
C. Human-to-human transmission through fecal–oral contamination
D. A and C
E. All of the above

The correct answer is D.

Diagnosis Coding

The stated diagnosis in this case is neurocysticercosis. In ICD-9-CM,[2] there is not a specific code for neurocysticercosis, so the condition would be coded to cysticercosis. A second code to denote the manifestation is also indicated. Though potential for further seizures is discussed, the diagnosis of epilepsy is not stated after this single seizure. The code list for this patient is:

123.1 Cysticercosis
780.39 Other convulsions

In ICD-10-CM, there is a specific code for neurocysticercosis. The codes in ICD-10-CM[3] are:

B69.0 Cysticercosis of the central nervous system
R56.9 Unspecified convulsions

This AAN guideline is endorsed by the American Epilepsy Society.

[1]Evidence-based guideline: Treatment of parenchymal neurocysticercosis. Report of the Guideline Development Subcommittee of the American Academy of Neurology. Neurology® 2013;80:1424–1429.
[2]Centers for Disease Control and Prevention. International classification of diseases, ninth revision, clinical modification (ICD-9-CM). *www.cdc.gov/nchs/icd/icd9cm.htm.*
[3]Centers for Disease Control and Prevention. International classification of diseases, tenth revision, clinical modification (ICD-10-CM). *www.cdc.gov/nchs/icd/icd10cm.htm.*

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