CASE REPORT

Bleeding from a gut lesion as a cause of seizure

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Accepted 17 April 2015

SUMMARY

The differential diagnosis of causes of seizure is important since appropriate management depends on correct diagnosis. Making a misdiagnosis of epilepsy may lead to erroneous clinical management, and can be minimised with careful history taking and physical examination. Our educational case illustrates a patient with presumed epilepsy based on a witnessed generalised tonic-clonic seizure; he was ultimately diagnosed as upper gastrointestinal bleeding initially considered by careful attention of vital signs and rectal examination, and confirmed and treated by emergent endoscopy. Paying careful attention to the symptoms and signs in patients with seizure episodes is crucial to establishing a correct causative diagnosis for seizure.

BACKGROUND

Epilepsy is a chronic brain disorder characterised by recurrent seizures that vary from brief lapses of attention and involuntary muscle movements to severe and prolonged convulsions. In Japan, approximately 1.2 million people (about 1% of the total population) are known to have epilepsy.¹ Although new-onset epilepsy is the most common cause of a first seizure, patients presenting with a seizure may not always have epilepsy, but may instead have systemic diseases leading to brain hypoperfusion, thereby causing the seizure.

If provoked by various types of metabolic, drug-induced, circulatory or other systemic stimuli, the central nervous system can generate a neuronal activity causing a single seizure or multiple seizures. Such provoked seizures caused by correctable or avoidable systemic pathology do not indicate that a patient has epilepsy, while a diagnosis of epilepsy can only be given when there is a proved tendency towards recurrent and unprovoked seizures. We present a case of a patient with seizure who was initially considered as having a diagnosis of epilepsy on arrival, and was later found to have gastrointestinal bleeding as an origin of circulatory collapse compromising brain perfusion leading to seizure. In this case, we also show that a bedside measurement of postural blood pressure change is helpful for identifying such a circulatory collapse.

CASE PRESENTATION

A 48-year-old Japanese man was brought to the emergency department of our hospital by his family, who claimed that the patient became unconscious with lying down at home and had intermittent generalised tonic-clonic seizures.

The patient was in his usual state of health until a day prior to admission, when he told his family that he had appetite loss, nausea and fatigue.

According to his family, the seizures had ceased spontaneously in a few minutes but occurred again with loss of consciousness for about 30 s. The patient smoked one pack of cigarettes per day but did not drink alcohol or use illicit drugs. He had no significant medical history and used no regular medications.

On physical examination, he was alert and oriented and the vital signs were: blood pressure 90/60 mm Hg, heart rate 90 bpm, respiratory rate 12 bpm, temperature 35.4°C and pulse oximetry oxygen saturation of 95% while breathing ambient air. There was slight anaemia but no jaundice in the conjunctivae. Lungs and cardiac examinations were normal. There was no abdominal distention, tenderness or percussion tenderness on the abdomen, but rectum examination showed tarry stool. The rest of the examination, including neurological, was normal.

Laboratory data showed normocytic anaemia with haemoglobin 10.6 g/dL and haematocrit 33%, blood urea nitrogen 49.8 mg/dL and serum creatinine 0.82 mg/dL. ECG showed normal sinus rhythm and no wave form abnormality. Head CT scan showed normal study (figure 1).

A tentative diagnosis of epilepsy was given based on two consecutive episodes of the seizure at home. However, after we reviewed the abnormality of vital signs (tachycardia and relatively low blood pressure) and tarry stool, we performed a bedside head-up tilt test (figure 2),² which showed blood pressure decreased from 90/60 to 60/40 mm Hg, with faintness; at the same time, apparent tonic-clonic seizure-like activity was also provoked. A diagnosis of upper gastrointestinal bleeding was

Figure 1 Head CT scan without abnormality.

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To cite: Watari T, Tokuda Y. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-205619

Figure 2 Illustration of bedside tilt test. Pulse and blood pressure measurement are obtained in the supine position after a rest of greater than 2 min, measurements are then repeated immediately, 1 min and 2 min after sitting up. Pulse increase >30 /min or systolic blood pressure decrease >10 or 20 mm Hg in sitting position from the supine is consider as the positive test result.

considered and the patient underwent urgent oesophagogastrroduodenoscopy with intravenous infusion of omeprazole. The endoscopy revealed an actively bleeding ulcer in the duodenum (figure 3); endoscopic haemostasis was conducted successfully without requirement of blood transfusion. The seizures quickly disappeared after this early treatment and the patient made an uneventful recovery. He was discharged with maintenance therapy of oral proton pump inhibitor. The seizures have not recurred during 6-month follow-ups after discharge.

DISCUSSION

We presented a case with an initial tentative diagnosis of epilepsy, which was later changed to a diagnosis of duodenal ulcer with active bleeding. As many as 20–30% of patients with seizure may have been misdiagnosed as epileptics. Some of these patients may have cardiovascular syncope with abnormal limb movements due to cerebral hypoxia, which it may sometimes be difficult to differentiate from epilepsy on clinical grounds.² Initial evaluation and standard management after a seizure should include normalisation of vital signs and cessation of

seizure activity, and determination of indication for pharmacological intervention for seizure control if seizures are prolonged over 5 min or repeated.^{3 4} In the current case, the patient made a recovery without anticonvulsant therapy and no recurrence of seizures. Gastrointestinal haemorrhage was the aetiology of circulatory collapse causing brain hypoperfusion, based on the proof presented by positive bedside head-up tilt testing, which revealed orthostatic hypotension along with the actual seizures.

In cognitive psychology, mental short cuts are frequently used in our reasoning processes as heuristics, but sometimes these heuristics may lead to biased thinking. Among many biases, availability bias is a prime example.⁵ Availability bias leads us to judge likelihood by the ease with which hypotheses are postulated. A generalised tonic-clonic seizure quickly reminds us of a probable diagnosis of epilepsy, which turned out to be incorrect and dismissed later in our case.

However, because of the broad possibility for differential diagnosis of seizure (box 1), physicians should be careful when making a diagnosis of epilepsy in patients, especially with the

Figure 3 Oesophagogastrroduodenoscopy image at admission, showing haemorrhagic ulcer in the first portion of the duodenum.

Box 1 Differential diagnosis for causes of seizure

Primary central nervous system disease (broadly diagnosed epilepsy)

- ▶ Epilepsy (narrowly diagnosed epilepsy)
- ▶ Brain lesions: stroke, bleeding, encephalitis, encephalopathy, etc

Brain hypoperfusion by circulatory collapse

- ▶ Massive bleeding: gastrointestinal, traumatic, ectopic pregnancy, etc
- ▶ Cardiac dysrhythmia

Metabolic derangement

- ▶ Hypoglycaemia
- ▶ Electrolyte abnormality: Hyponatremia, hypocalcaemia, etc
- ▶ Thyroid crisis

Toxicological disease

- ▶ Alcohol (including withdrawal syndrome)
- ▶ Drug: theophylline, amphetamine, cocaine, etc
- ▶ Poisoning: organophosphate, etc

first episode of seizure, and should consider other possibilities including metabolic, drug-induced, circulatory or other systemic conditions.⁶ In a series of 166 adults with a first seizure, the most common aetiologies diagnosed with CT and MRI were cerebrovascular lesions (26%), brain tumours (12%), traumatic scar formations (5%) and other conditions (4%).⁷ Head-up tilt testing can have a role in identifying cases of convulsive vasovagal syncope in patients with suspected systemic causes for seizure.

Circulatory collapses, including orthostatic hypotension as well as ventricular tachycardia and neurocardiogenic syncope, may lead to seizure.⁸ Neurocardiogenic syncope is a common cause of transient loss of consciousness in the general population, accounting for 40% of all such events evaluated in the out-patient setting, but in this condition, tilt test has also been demonstrated to provoke seizures.⁹ However, among those who underwent head-up tilt testing, 5% of patients had tonic-clonic seizures provoked by tilt-table testing, and the testing was considered as theoretically provoking cerebral hypoperfusion.¹⁰ Since many patients would be too ill to stand up, we sometimes conduct this bedside tilt test by measuring sitting blood pressure

for detecting acute blood loss in patients with gastrointestinal bleeding as orthostatic vital sign changes.¹¹

Our case illustrates that careful history taking and physical examination of patients with seizure are crucial to establishing a correct diagnosis for the cause of seizure. Physicians should consider other systemic causes other than epilepsy and a full assessment should be performed to rule out primary neurological disease in first episodes of seizure.

Acknowledgements The authors would like to thank all the clinical staff who took care of this patient.

Contributors TW cared for the patient. TW and YT wrote the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- Detailed history taking and physical examination are of paramount importance to establish a reliable diagnosis in patients with seizure.
- In patients with seizure activities, considering a broad differential diagnosis should be employed, especially for those with a first episode of seizure.
- Understanding availability bias may help us avoid cognitive errors in diagnostic reasoning.
- Head-up tilt testing can have a role in identifying cases of convulsive syncope in patients with suspected hypovolemia.

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