Generalized seizure, the only manifestation of a small ischemic atherothrombotic infarction

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BACKGROUND: According to the literature, generalized seizure as a presenting sign of stroke is rare, and in the reported cases it was accompanied by a focal neurological deficit. Presentation of a small ischemic atherothrombotic brain infarction with convulsive generalized seizure is very rare.

METHODS: We reported a patient with acute small ischemic atherothrombotic infarction associated with an episode of generalized tonic-clonic seizure, a rare clinical manifestation in this type of stroke. The patient was treated with anti-epileptic therapy after admission.

RESULTS: The patient was discharged with oral administration of phenytoin 100 mg TDS, aspirin 80 mg daily, and atorvastatin 40 mg daily.

CONCLUSION: Small ischemic atherothrombotic infarction can present only with a seizure without any focal neurological deficit.

KEY WORDS: Small ischemic atherothrombotic infarction; Seizure; Neurological deficit

INTRODUCTION

Seizure as the presenting symptom of stroke has been reported previously.\textsuperscript{[1]} Multivariate analysis of the reports revealed that cortical location was the only risk factor after either types of stroke.\textsuperscript{[1]} Seizure as the presenting sign of a small atherothrombotic infarct is very rare and it was reported to be associated with a focal neurological deficit.\textsuperscript{[2]}

CASE REPORT

A 67-year-old man admitted to our emergency medicine department with an episode of generalized tonic-clonic seizure. This was the first seizure he had ever experienced in his life, which was accompanied by 2 minutes of tonic-clonic movements, upward gaze, urine incontinency, tongue biting and post-ictal confusion. He had a history of hypertension and he used amelodipine for it. The patient smoked cigarettes but did not drink alcohol or use illicit drugs. He did not have any history for trauma. His familial history for epilepsy was negative. The classic presentation of the generalized tonic-clonic seizure excluded other differential diagnoses such as limb shaking.

On physical examination, the patient was right-handed, appeared arouse and conscious. Vital signs were normal except for his blood pressure which was 170/90 mmHg. While systemic physical examinations were within normal limits; neurological examination after post-ictal phase of seizure showed that he was alert, oriented and obeyed orders (Glasgow Coma Scale 15). Cranial nerves, motor examination, sensory and cerebellar tests were within normal limits with no focal neurological deficit.

Laboratory tests were significant for hyperglycemia (FBS 220 mg/dL with normal range of 60–159 mg/dL), HbA1C 9.1 g/dL, hypercholesterolemia (cholesterol 256 normal<200, HDL 28 normal>40, LDL 195...
normal<150). Brain computed tomography (CT) did not show any significant abnormality. Then the patient was subjected to brain magnetic resonance imaging (MRI) and MR venography (MRV), showing multiple acute atherothrombotic infarcts of the subcortical and deep white matter in the right hemisphere on diffusion weighted imaging (DWI) sequence (Figure 1). The result of MRV was normal.

The electroencephalogram (EEG) and Doppler sonogram of the neck carotid arteries were nothing abnormal. Holter monitor test and echocardiography did not show arrhythmia or significant structural heart disease, but left ventricular hypertrophy. Brain CT angiography showed mild narrowing of left M1 and M2 segments of the middle cerebral artery. The basilar artery had a short segment of moderate to severe stenosis and both common carotid bulbs and proximal parts of internal carotid arteries had mild stenosis (Figure 2A, B).

The seizure did not recur during the proper anti-epileptic therapy and the patient was discharged after the administration of oral phenytoin 100 mg TDS, aspirin 80 mg daily, and atorvastatin 40 mg daily.

DISCUSSION

Previous studies\cite{3,4} have reported that the presence of seizures predicted the involvement of the anterior circulation and cortical structures. Studies\cite{5,6} on adults with lacunar infarcts have demonstrated that additional lesions may be responsible for seizure presentation in addition to the subcortical lesion of lacunar infarcts. Kilpatrick et al\cite{7} found early seizures in 24 (4%) of 604 patients with ischemic stroke (or 4.4%, excluding brain stem and cerebellar strokes, as did Bladin et al\cite{8}). All 24 patients with early seizures had cortical infarcts of the anterior circulation. So et al\cite{9} reported that lacunar infarction was associated with seizures in 2.6% of their cases, although the relationship between seizure and lacunar infarcts was questioned. However, risk factors for lacunar diseases, including hypertension, serum hypercholesterolemia, and left ventricular hypertrophy,\cite{10-12} were associated with the development of seizures or epilepsy, even in those without overt stroke. Avrahami et al\cite{13} reported generalized epileptic seizure in 5 elderly hypertensive patients who had lacunar infarcts on their follow-up brain CT scans. Three patients developed hemiparesis after seizure. Arboix et al\cite{14} reported 8 patients with small atherothrombotic infarcts who were identified as having pure sensory stroke. There was a report about the increased in-hospital mortality of patients with atherothrombotic

![Figure 1. Brain MRI without GAD (DWI sequence) demonstrating multiple acute lacunar infarcts of the subcortical and deep white matter in the right hemisphere.](image1)

![Figure 2. Brain CT angiography of the patient. A and B: Mild narrowing of left M1 and M2 segments of the middle cerebral artery. The basilar artery had a short segment of moderate to severe stenosis and both common carotid bulbs and proximal parts of internal carotid arteries had mild stenosis.](image2)
strokes which were associated with early (within 48 hours) seizures.[15]

In conclusion, generalized seizure as a presenting sign of stroke is rare and in the reported cases it was accompanied by a focal neurological deficit. But our patient had a small ischemic atherothrombotic infarct only presenting with a seizure without any focal neurological deficit.

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