Case Report

Stroke in Patients with Dengue

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Background: Central nervous system infections are one of the common causes of stroke in developing countries. Stroke after dengue is uncommon. *Case Reports:* A total of 1148 dengue cases were seen in a tertiary referral hospital during the epidemic from September to November 2008. We present 3 patients who had stroke caused by dengue. The first patient was a 45-year-old woman with dengue hemorrhagic fever who developed sudden right arm and leg weakness. Magnetic resonance imaging (MRI) revealed multiple hemorrhagic foci in the left parietal and temporal lobes. The second patient was a 35-year-old man who developed fever that was followed by altered sensorium and quadriparesis. MRI showed bilateral cerebellar hemorrhages with edema, obstructive hydrocephalus, and multiple watershed infarcts. The third patient was a 70-year-old woman who presented with giddiness for 2 days followed by sudden weakness of the left side of the body. She developed fever after admission. MRI showed infarct in the right parietal lobe. All the patients had low platelet count and one patient died. *Conclusions:* Dengue might be an important cause of stroke in epidemic regions when patients present with fever, focal neurologic deficits, and encephalopathy. **Key Words:** Dengue—neurologic manifestation—stroke.

In developing countries central nervous system infections are one of the common causes of stroke.[1] Dengue is caused by a *Flavivirus* transmitted by the bite of the mosquito *Aedes aegypti*.[1] In tropical countries, 2.5 billion people are at risk of contracting the infection.[1] The estimated median cost of treatment per hospitalized patient with dengue in India is US $432.20, and the average total economic burden is estimated to be US $27.4 million.[2]

The common manifestations of dengue include high fever, headache, and myalgias.[1] The atypical manifestations include dengue encephalitis, myocarditis, hepatitis, and cholecystitis.[3] Neurologic manifestations of dengue have been reported that include acute pure motor quadriplegia,[4] Guillain-Barré syndrome,[5] transverse myelitis, and peripheral nerve palsies in the postinfectious stage.[1]

We report a case series (3 cases) of stroke of 1148 patients with dengue who were seen during a recent outbreak from September to November 2008.

Case 1

The first patient was a 45-year-old woman, not a known diabetic or hypertensive, who presented with a history of fever for 7 days. She was given the diagnosis of dengue hemorrhagic fever, right-sided pleural effusion, ascites, and cholelithiasis. There were no signs of meningeal irritation. Her platelets on admission were 75,000 cell/mm^3, and her aspartate aminotransferase and alanine aminotransferase levels were 731 U/L and 2012 U/L, respectively. Blood culture revealed negative findings. The dengue serum IgM enzyme-linked immunosorbent assay (ELISA) antibody test revealed positive results. Two days

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Table 1. *Clinical presentation, stroke characteristics, and outcome of 3 patients*

Age and sex	Clinical presentation	Dengue symptoms	Stroke type	Severity/outcome
1. 45 y Female	Altered sensorium right upper and lower limb weakness	Fever, multiorgan involvement thrombocytopenia	Multiple hemorrhages	NIHSS score 17/mRs score 6
2. 35 y Male	Altered sensorium quadriparesis	Fever, vomiting thrombocytopenia	Cerebellar hemorrhage watershed infarcts	NIHSS score 16/mRs score 1
3. 70 y Female	Left upper and lower limb weakness	Fever thrombocytopenia	Parietal infarct	NIHSS score 3/mRs score 1

Abbreviations: mRs, modified Rankin scale; NIHSS, National Institutes of Health Stroke Scale.

after admission, she developed sudden altered sensorium and right upper and lower limb weakness (National Institutes of Health Stroke Scale [NIHSS] score 17) (Table 1). Magnetic resonance imaging (MRI) revealed multiple hemorrhagic foci in the left parietal and temporal lobes (Fig 1). Echocardiogram, lipids, and carotid Doppler studies produced normal findings. Her sensorium deteriorated and was treated in the intensive care department. Despite multiple blood and platelet transfusions, her platelets continued to decrease to a low of 27,000 cell/mm^3. On the 16th day after admission she died of the illness.

Case 2

The second patient was a 35-year-old man, not a known diabetic or hypertensive, who presented with fever for 3 days, vomiting for 2 days, and altered sensorium for 1 day. He had quadriparesis with brisk deep tendon reflexes and extensor plantar bilaterally (NIHSS score 16) (Table 1). Neck stiffness and Kernig sign revealed negative findings. MRI revealed bilateral cerebellar hemorrhages with edema, mass effect, obstructive hydrocephalus, and multiple areas of watershed infarcts in diffusion-weighted images (Fig 2). His platelets were 30,000 cell/mm^3. The dengue-specific serum IgM ELISA antibody test revealed positive findings. Blood culture did not grow any organism. External ventricular drainage was done for obstructive hydrocephalus. Lipids, echocardiogram, and carotid Doppler studies produced normal results. He symptomatically improved and was discharged 10 days later. He had mild gait ataxia with brisk deep tendon reflexes at the time of discharge. At 1-month follow-up the modified Rankin scale score was 1.

Case 3

The third patient was a 70-year-old woman, a known hypertensive on medications, who presented with giddiness for 2 days and sudden weakness of the left side of the body (NIHSS score 3) (Table 1). She developed fever after admission. There were no meningeal signs. MRI revealed infarct in right parietal lobe (Fig 3). Her platelets were 30,000 cell/mm^3, and her aspartate aminotransferase and alanine aminotransferase levels were 250 U/L and 170 U/L, respectively. Serum IgM ELISA antibody test for dengue revealed positive findings and blood culture

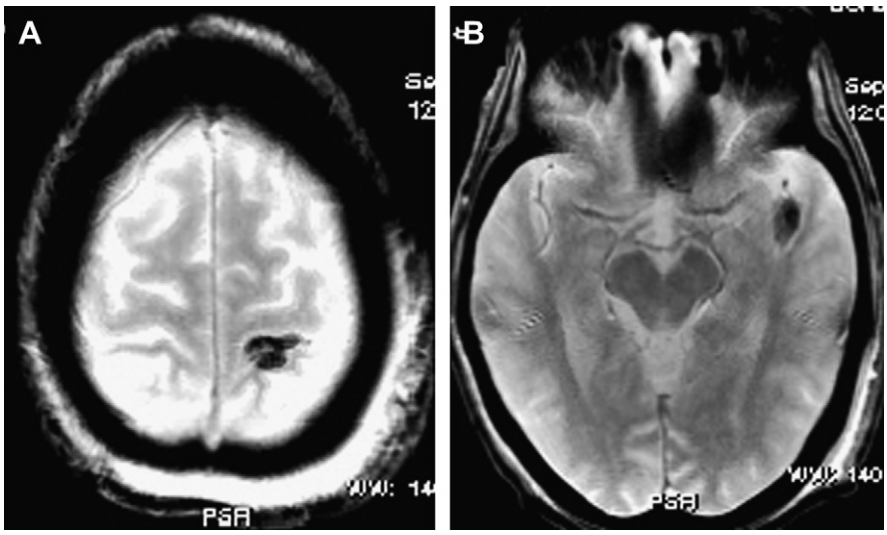

Figure 1. *MRI (gradient echo) with hemorrhage in left parietal and temporal lobes.*