

A Case of Japanese Encephalitis with Classic Neuro Imaging Findings

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Clinical Image

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ABSTRACT:

Japanese Encephalitis is a mosquito borne disease caused by Japanese Encephalitis (JE) virus, most important cause of viral encephalitis in Asia. Most cases are asymptomatic or mild. Mortality rates are higher if neurological sequelae develops. Bilateral thalamic involvement is classical regardless of CT or MR imaging. We report a case of 16 year old boy having Japanese encephalitis from endemic area of Bangladesh with classical CT findings.

Key words: Japanese encephalitis, Neurological sequelae, Classical CT finding.

INTRODUCTION:

Japanese encephalitis (JE) is the most commonly diagnosed epidemic encephalitis in the world and is found throughout Asia. The most comprehensive estimate of incidence within the past decade suggests that 69,000 cases of Japanese encephalitis occur every year¹, with a case fatality rate can be as high as 30%, permanent neurologic or psychiatric sequelae can occur in 30%–50% of those with encephalitis. In Bangladesh, all JE cases from rural areas, 62% among older than 15 years of age which mirrors similar trends in Nepal and parts of India.² The incidence of JE is increasing due to inadequate control measures and also increases in vector density. Vaccination should be recommended for those would like to visit JE virus endemic regions in a country, especially in the rainy season.³ There is no cure for the disease; treatment is mainly focused on symptomatic management and supportive care. Safe and effective vaccines are available to prevent JE. In comparison with other commonest cause of encephalitis like herpes simplex, meningeal signs, seizures and behavioral abnormalities in HSE; and decerebration or decortication and focal neurologic signs in JE were common). In HSE, CT scan revealed fronto-temporal hypo-density where bilateral thalamic involvement is classical for JE.

CASE REPORT:

A-16-year old boy from rural area of Rangamati district, Bangladesh was admitted to Square hospital ICU in intubated state with history of high grade fever for 7 days and altered level of consciousness for 3 days on 24th July, 2024. Initially he got admitted at a local hospital there, later while shifting to Dhaka for advanced care, he got intubated in ambulance due to low GCS level. On examination, patient's GCS was E1VtM1, neck rigidity present, pupil-reacting and equal, febrile, hemodynamically unstable, on inotropes/vasopressors. Malaria parasite was negative, anti dengue antibody as well. A lumbar puncture was performed, followed immediately by the administration of Ceftriaxone, Acyclovir and Artesunate. The cerebrospinal fluid (CSF) revealed 95 leukocyte/mm³ with predominant lymphocytes (93%), elevated protein concentration (219 mg/dl) and normal glucose levels. PCR for herpes simplex virus, cytomegalovirus, Epstein-Barr virus were all negative. Brain computed tomography (CT) was performed on day of admission which reveals symmetrical hypodensity in both thalamus, (planned for MRI brain but couldn't be performed as patient's hemodynamic instability). CSF specimen was sent to reference laboratory for further analysis which reveals positive serology for Japanese Encephalitis. Later patient was shifted to a government hospital due to financial issues, still comatose with ongoing supportive treatment. He was lost to follow-up.



Fig-1: CT finding of our patient (JE) is showing bilateral thalamic hypodense lesion

DISCUSSION:

Japanese Encephalitis virus (JEV) is a Flavivirus related to dengue, yellow fever and West Nile viruses, and is spread by mosquitoes. Around 24 countries in the WHO South-East Asia and Western Pacific regions have endemic JEV transmission, exposing more than 3 billion people to risks of infection.⁴ Most JEV infections are mild (fever and headache) or without apparent symptoms, but approximately 1 in 250 infections results in severe clinical illness. The incubation period is between 4-14 days. In children, gastrointestinal pain and vomiting may be the dominant initial symptoms. Severe disease is characterized by rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis and ultimately death. The case-fatality rate can be as high as 20-30% among those with disease symptoms of those who survive, 30%-50% suffer permanent neurological sequelae.⁵

JEV is transmitted to humans through bites from infected mosquitoes of the *Culex* species. In most temperate areas of Asia, JEV is transmitted mainly during the warm season, when large epidemics can occur. In the tropics and subtropics, transmission can occur year-round but often intensifies during the rainy season and pre-harvest period in rice-cultivating regions. Individuals who live in or have travelled to a JE-endemic area and experience encephalitis are considered a suspected JE case. The overall incidence of JE among persons from non-endemic countries traveling to Asia is estimated to be less than one case per 1 million travelers.^{5,6}

A laboratory test is required in order to confirm JEV infection and to rule out other causes of encephalitis. WHO recommends testing for JEV-specific IgM antibody in a single sample of cerebrospinal fluid (CSF) or serum, using an IgM-capture ELISA. Serologic assays can provide false-positive results due to cross-reactive antibodies from other flavi virus infections or vaccines (e.g., dengue, tick-borne encephalitis, West Nile, or yellow fever viruses.⁷ Magnetic resonance imaging findings in bilateral thalamic are characteristic of flavivirus encephalitides; however, other areas of involvement may also be seen.^{8,9}

CONCLUSION:

There is no antiviral treatment for patients with JE. JE should be considered in the differential diagnosis for any patient with an acute neurological infection who recently been in a JE endemic country. Treatment is supportive to relieve symptoms and stabilize the patient. Safe and effective JE vaccines are available to prevent disease. WHO recommends having strong JE prevention and control activities, including JE immunization in all regions where the disease is a recognized public health priority, along with strengthening surveillance and reporting mechanism. For most travellers who travel to Asia, the risk of JE is very low but varies based on destination, length of travel, season, and activities.¹⁰ Even if the number of JE-confirmed cases is low, vaccination should be considered where there is a suitable environment for JE virus transmission.

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