



Case Report

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Dengue fever presenting with cerebellitis: A case report

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ABSTRACT

Rationale: Dengue fever is a mosquito-borne viral infection, which commonly presents as an acute febrile illness. As the number of cases increases, rare manifestations including neurological manifestations are occasionally encountered.

Patient concerns: A 20-year-old female presented with fever for 3 days with slurring of speech and unsteady gait, which were developed from the third day of illness. On examination, she had bilateral cerebellar signs. Dengue non-structural protein 1 antigen and dengue IgM in serum were positive. Her cerebrospinal fluid analysis and magnetic resonance image brain were normal.

Diagnosis: Dengue cerebellitis.

Intervention: Supportive management with fluids including oral rehydration solutions and intravenous fluids and paracetamol.

Outcome: Cerebellar symptoms and signs completely resolved by the 20th day of illness.

Lesson: Dengue cerebellitis is an unusual neurological manifestation of dengue infection.

KEYWORDS: Dengue fever; Cerebellitis; Neurological manifestations

1. Introduction

Dengue fever is one of the most common arthropod-borne viral infections transmitted by the mosquitoes of the genus *Aedes* in tropical and subtropical countries[1]. In recent years, the incidence of dengue fever has increased dramatically across the world[1]. There were 36 628 reported cases in Sri Lanka in the first 5 months of 2023[3]. As the disease prevalence increases, rare manifestation

are also increasingly reported, and there are many reports of neurological manifestations[4,5]. There are only 4 cases of dengue cerebellitis reported in Sri Lanka so far[5]. We report a case of a young female patient with a bilateral cerebellar symptoms and signs with serologically confirmed acute dengue infection.

2. Case history

A 20-year-old previously healthy university student presented with a history of fever, headache, arthralgia, myalgia, vomiting and loose stools for 3 days duration. She developed slurring of speech and unsteadiness since the 3rd day of illness. She didn't have mouth deviation and there was weakness of upper limb or lower limb. There was no photophobia, phonophobia or seizures. There were no respiratory or urinary symptoms.

The general examination was normal except fever. There were no features of meningism. Her pulse rate was 110 (regular and good volume) and blood pressure was 110/70 mmHg. On neurological examination, the patient was conscious and rational with the Glasgow Coma Scale of 15/15. She had scanning dysarthria, intentional tremor, bilateral horizontal nystagmus, dysmetria and

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dysdiadokokinesia with wide based ataxic gait. Muscle tone, power, reflexes, and sensory examination of bilateral upper and lower limbs were normal. Her respiratory and abdominal examinations were also unremarkable.

Her investigations on admission were as follows: Full blood count revealed leukocyte $4.71 \times 10^3/\mu\text{L}$ with lymphocyte predominant, a hemoglobin level of 12.6 g/dL with a hematocrit 37.0% and platelet $74 \times 10^3/\mu\text{L}$. NS1 antigen for dengue virus was positive on the 3rd day of illness. Her renal functions and blood sugar were normal. Her transaminases were elevated with normal international normalization ratio.

MRI brain was done on the 5th day of illness which was normal. Serum dengue IgM antibody was positive, and a negative IgG antibody level by enzyme-linked immunosorbent assay on the 8th day of illness. Human immunodeficiency virus, Serum herpes simplex virus, Epstein Barr virus and cytomegalovirus antibodies were negative. Lumbar puncture was delayed due to dropping platelet count and carried out on the 8th day of illness. Cerebrospinal fluid (CSF) full report was normal with a negative dengue polymerase chain reaction (on the 8th day). CSF dengue IgM antibody was not available in the government sector during the time and not done due to financial constraints.

A presumptive diagnosis of dengue cerebellitis was made. She was symptomatically managed with oral rehydration solutions and overnight intravenous fluids. Point of care ultrasound scan was carried out in regular intervals and there was no evidence of plasma leakage detected. Full blood count, serum electrolyte and transaminases were monitored.

Here platelet count continues to drop to the lowest count of $50 \times 10^3/\mu\text{L}$ on the 6th day of illness and then started to rise from the 7th day of illness. Her transaminases continue to rise to a value of 20 times of upper limit and then started to fall. The cerebellar symptoms and signs started to improve from the 8th day of illness. She was discharged on the 13th day of illness when fever was settled, and transaminases started to fall. She was followed up in the clinic and her cerebellar symptoms and signs were completely resolved by the 20th day of illness.

3. Discussion

Dengue fever has various clinical manifestations ranging from a self-limiting febrile illness to a dengue hemorrhagic fever leading to shock and multiorgan dysfunction which is a serious but less common manifestation[6]. Dengue fever can cause some atypical presentation including hepatitis, renal failure, acalculous

cholecystitis, myocarditis, and neurological manifestations[7]. Neurological manifestation can occur in about 0.5% to 21% of patient admitted with dengue infection[4]. Neurological manifestations categorized into encephalopathy, encephalitis, neuromuscular and neuro-ophthalmic involvement based on different pathogenesis[4].

The first case of cerebellar involvement in dengue was reported in Sri Lanka in a case series by Weeratunga *et al*[8]. Cerebellar involvement in dengue in adults has been reported only in 7 instances so far[5,8–11]. The absolute mechanism for the neurological manifestation in dengue infection remains unknown but the proposed mechanisms are both direct viral invasion and immune mediated mechanism[4]. CSF analysis was rarely carried out in a dengue patient with neurological manifestation[3]. Among all reported cases of dengue cerebellitis, CSF analysis showed lymphocytosis only in 2 cases[5,8–11]. MRI brain revealed hyperintensities in cerebellum in 3 of the cases and normal in other reported cases.

We made a diagnosis of dengue cerebellitis in our patient based on serologically positive dengue infection with bilateral cerebellar signs, negative serology of other possible viral infection with normal MRI brain and CSF analysis. However, detection of dengue IgM in CSF has a limited sensitivity and we were unable to go ahead with dengue IgM in CSF[11]. CSF dengue RNA, carried out on the 8th day, was not detected in our patient. It was positive only if tested during first week of symptoms onset. The cerebellar signs and symptoms were completely resolved in our patient with supportive management, highlighting the self-limiting nature of the illness without any sequelae.

Dengue cerebellitis is a rare self-limiting neurological manifestation of dengue fever with full recovery without any sequelae. Dengue cerebellitis should be considered as a differential diagnosis in patients presenting with acute febrile illness and cerebellar features in endemic areas.

Conflict of interest statement

The authors declare that they have no conflict of interest.

Ethical approval and patient's consent

Written informed consent for patient information and images to be published was provided by the patient.

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Authors' contributions

SS developed the theoretical formalism, performed the analytic calculations and performed the numerical simulations. SS and LFS contributed to the final version of the manuscript. PR edited and proof checked the manuscript. DA and PJ supervised the project.

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