

Dengue meningoencephalitis: a rare complication in a dengue patient with non haemorrhagic manifestations—case report

Abstract

Dengue fever is one of the most common mosquito-borne infectious diseases prevalent in South Asia with recent epidemic outbreaks creating a massive health burden on socio-economic status on Sri Lankans. Dengue is a self-limiting febrile viral illness with fewer predilections to the central nervous system (CNS). We report a case of a 19 year-old boy treated for simple dengue fever without hemorrhagic manifestations, who develop features of meningism on day 7 of illness. Non-contrast computerized tomography (CT) and magnetic resonance imaging (MRI) of the brain was normal. An electroencephalogram (EEG) showed generalized slowing with evidence of encephalopathy and CSF showed a lymphocytic pleocytosis with positive dengue IgM antibody. The patient developed signs of recovery on day 12 of illness, and he was followed up in the clinic, with no residual neurological sequel observed at 3 months. This depicts direct viral extension of dengue virus to the central nervous system, which is rarely documented in uncomplicated dengue fever.

Keywords: dengue, dengue meningoencephalitis, non-haemorrhagic manifestations

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Abbreviations: CNS: Central Nervous System; CT: Computerized Tomography; MRI: Magnetic Resonance Imaging; EEG: Electroencephalogram; AST: Aspartate Aminotransferase; ALT: Alanine Aminotransferase; PCR: Polymerase Chain Reaction

Introduction

Dengue is considered as one of the commonest arthropod-borne febrile viral infections affecting humans in the tropics. It has become a health hazard in some of the South Asian countries especially in countries like Sri Lanka and India. It is an arboviral disease transmitted by *Aedes sp.* mosquitoes (*Aedes aegypti* and *A. albopictus*). Four serotypes of the dengue virus have been identified to cause disease in humans. Lifelong immunity following recovery from a particular serotype is described but does not confer protection for an infection with a different serotype.¹ Although rare, effects of dengue on the central nervous system (CNS) is increasingly being observed, which has become a challenge in clinical practice especially in dengue patients with hemorrhagic complications.² Direct viral extension of the virus to the CNS seems to cause a self-limiting encephalitis. A place unsure what “place” means? Do you mean “target?” for antiviral treatment has not been validated.

Case report

A 19 year-old previously healthy school boy presented with fever for 2 days with body aches, mild headache and constitutional symptoms. The patient had no other systemic symptoms. He had no history of any significant medical illnesses. On admission, he was febrile with a temperature of 100°F and a stable blood pressure of 120/90 mmHg. His abdomen was soft, and no hepatosplenomegaly was noted. Other systemic examination was normal with no evidence of any central nervous system involvement. The patient's initial full blood count had a WBC of 5.83×10^3 and Hb of 14.5 g/dl and a platelet count of 257×10^3 . Dengue NS1 antigen was positive on day 2. A liver function test recorded as aspartate aminotransferase (AST) was

43U/L and alanine aminotransferase (ALT) was 63U/L with a normal bilirubin level. Prothrombin time/international normalized ratio (PT/INR), serum electrolytes, blood urea and serum creatinine were all in the normal range.

The standard management protocol of the febrile phase management was carried out in keeping with the current dengue guidelines. On day 5, the fever subsided, and the patient started to show signs of recovery with no evidence of fluid leakage. Clinical improvement was seen by day 5 with signs of recovery and with the platelet count rising from a lowest of 108 to 111. Other than a liver derangement with an ALT of 412 U/L and an AST of 317U/L, an uneventful recovery was expected and the patient was planned to be discharged with the next rising platelet count. By afternoon of day 7, however, the patient complained of a severe headache and was found to be slightly disorientated. On examination, marked neck stiffness was noted with evidence of meningism. The Kernig sign was negative. No other focal neurological signs were elicited. Urgent non-contrast CT of the brain showed no abnormalities.

Lumbar puncture was performed and the CSF full report showed evidence of lymphocytic pleocytosis with 90% lymphocytes and elevated CSF protein and normal CSF sugar levels. CSF was positive for dengue IgM antibodies. The presence of herpes simplex virus tested by polymerase chain reaction (PCR) on CSF was negative. CSF culture showed no growth. EEG of the brain showed diffuse slowing in keeping with encephalopathy. An MRI scan of the brain showed no abnormalities. Virus isolation was not possible. IgM antibodies for leptospira, hepatitis B surface antigen, hepatitis C antibody and Weillfex test all were negative. Repeat tests for liver function (LFT), blood ammonia, serum creatinine, and serum electrolytes were normal. The patient was prophylactically started on intravenous ceftriaxone (1 g twice a day) and intravenous acyclovir (500 mg three times a day) while awaiting CSF reports after discussing with the microbiology team and monitoring the patient for complications. The patient started showing signs of clinical improvement 5 days after

onset of CNS symptoms and an EEG repeated 7 days after showed a marked improvement. Acyclovir and antibiotics were continued up to days 7 since not much evidence was available regarding antiviral therapy.

On discharge the patient was free of any residual neurological symptoms and the full blood count showed a platelet concentration of 581 and a WBC of 10.7 and CRP was with a LFT normalizing to an AST of 52U/L and an ALT of 140 U/L. The patient was symptom free at 1 month after being followed up at the medical clinic.

Discussion

Dengue fever has become one of the most common febrile illnesses prevalent in Southeast Asia and in the year 2017 alone has become the number one leading cause for hospital admissions in Sri Lanka with more than 100,000 cases already being reported by the end of 8 months compared to around 70,000 for the entire year of 2016.³ Simple Dengue fever presents as undifferentiated febrile illness with most patients recovering within few days without major complications. Dengue hemorrhagic fever and dengue shock syndrome are seen in a minority of patients but can lead to catastrophic complications and eventually death.⁴ CNS involvement of dengue virus is known to be rare, but various CNS related complications have been observed from encephalitis,

to Guillain–Barre, transverse myelitis and others.⁵

Meningoencephalitis is a rare manifestation of dengue fever that is reported mostly in patients with complications from dengue hemorrhagic fever.⁶ The CNS manifestations are thought to be due to probable vasculitis and fluid extravasation during the haemorrhagic phase rather than direct involvement, although a few reported cases describe direct involvement during the febrile phase.⁷ This case report highlights encephalitis developing towards the end of the febrile phase with features of clinical recovery, which is rarely documented in the literature. Therefore, clinical vigilance is necessary in identifying CNS infection rather than secondary infections, which are more common in patients recovering from dengue and lead to disorientation and headache. Therefore, dengue cases presenting with features of headache, confusion and meningism in regions with a high prevalence of the disease should always be considered with a rare differential diagnosis of possible CNS involvement and high vigilance is needed to identify such cases of dengue.

Conclusion

Dengue fever has become one of the leading causes of acute hospital admissions in recent years in Sri Lanka with patients developing various multi systemic complications. Nervous system involvement is relatively rare and even rarer in non–hemorrhagic patients. Reporting rare cases such as this patient will give an insight for future reference on considering dengue meningo– encephalitis in the workup and treatment of patients with meningism. The optimal antiviral treatment and efficacy has not been studied in Dengue CNS infection but most probably is self–limited but a course of antivirals may be tired in the absence of sufficient data.

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Conflict of interest

The authors declare that they have no competing interests.

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