**Abstract**

*Introduction*

With more than one-third of the world’s population living in areas at risk for transmission, dengue fever is a leading cause of illness and death in the tropics and subtropics. Neurological manifestations such as meningoencephalitis, acute disseminated encephalomyelitis, transverse myelitis and Guillain–Barre’ syndrome have been recognised as clinical consequences of dengue infection. Meningitis is a rare complication. This article reports a case of dengue meningitis.

*Case report*

We report the case of a 16-year-old Sri Lankan Sinhalese male who presented with fever, headache and neck stiffness without the typical symptoms of dengue infection. Dengue was suspected because of associated thrombocytopenia, and cerebrospinal fluid analysis shows lymphocytic pleocytosis and slightly elevated protein level. Dengue infection was confirmed by demonstration of IgM antibody in both serum and cerebrospinal fluid sample.

*Conclusion*

This case report demonstrates that cerebrospinal fluid analysis is necessary to differentiate headache due to systemic infection from that due to meningitis. In addition, meningitis can be the first manifestation of dengue infection. In endemic areas, dengue infection should be considered and tested as a probable aetiological agent of viral meningitis.

**Introduction**

With more than one-third of the world’s population living in areas at risk for transmission, dengue fever is a leading cause of illness and death in the tropics and subtropics. Although several neurological manifestations of dengue infection, such as meningoencephalitis, acute disseminated encephalomyelitis, transverse myelitis and Guillain–Barre’ syndrome have been described, the true prevalence is unknown owing to underdiagnosis and under-reporting of these rarer presentations. Meningitis is a rare manifestation of dengue fever, and only few such cases have been reported in the literature. Despite the high prevalence of dengue infection, meningitis caused by dengue virus has not been reported previously in Sri Lanka. We describe the first case of meningitis caused by an oligosymptomatic dengue infection that occurred during the dengue epidemic in 2013 in Sri Lanka.

**Case report**

A 16-year-old Sri Lankan Sinhalese male was admitted to our institution with symptoms of high-grade fever, generalised throbbing headache and vomiting for a duration of 4 days. He did not have arthralgia, myalgia, abdominal pain, bleeding manifestation or significant past medical history. Upon admission, he was rational and oriented. Neurological examination revealed neck stiffness with a positive Kernig’s sign. Rest of the examination was normal. Laboratory investigations upon admission showed thrombocytopenia (93 × 10^9/L), leucopenia (2800 × 10^9/L), normal haemoglobin and increased levels of liver transaminases (aspartate aminotransferase 384 U/L, alanine aminotransferase 112 U/L) with normal C-reactive proteins, erythrocyte sedimentary rate, serum creatinine and serum electrolytes. Brain computed tomography scan did not show any abnormalities. Cerebrospinal fluid (CSF) analysis showed white blood cell count of 112 cells/mm^3 (lymphocytes 88%), no red blood cells, CSF glucose 68 mg/dL (blood glucose 106 mg/dL) and CSF protein 97 mg/dL. CSF gram stain and fungal stains were negative and CSF bacterial culture was done. His CSF was tested for IgM antibodies against herpes simplex virus 1, 2 and Japanese encephalitis which were found to be negative. He was started on intravenous acyclovir and ceftriaxone. Despite his clinical improvement over next 2 days, his platelet count continued to drop, and hence the possibility of dengue infection was considered. His serum was positive for both dengue IgM antibody and non-structural protein 1 (NS1) antigen and his CSF was positive for dengue IgM antibody. By this time, CSF bacterial culture was available and was negative. Intravenous acyclovir and ceftriaxone were withheld. He was discharged on the tenth day of illness with complete recovery and was found to be well on follow-up.

**Discussion**

Dengue fever is currently the most important mosquito-borne viral infection of public health significance in Sri Lanka. Dengue meningitis is caused by any of the four dengue virus serotypes (DEN 1–4) that are closely...
related. Dengue virus serotypes 2 and 3 were the predominant circulating serotypes in Sri Lanka until 2009. However, since 2010, dengue serotype 1 has become the predominant serotype in Sri Lanka, accounting for more than 95% of dengue infections.  

Our case occurred during the dengue epidemic of 2013 and did not have the typical clinical features of dengue infection. There was no history of arthralgia, myalgia, abdominal pain and bleeding manifestations. The main symptoms were high-grade fever with severe generalised headache, which was refractory to analgesics. Headache is a very common symptom in patients with dengue fever, and severe or very severe headache is reported in 79% of patients with dengue fever. As CSF analysis is not done routinely to differentiate 'non-specific dengue headache' from dengue meningitis, a number of patients with dengue meningitis may remain undiagnosed. However, in addition to headache, presence of neck stiffness with a positive Kernig's sign in our patient pointed toward the clinical diagnosis of meningitis.

A number of neurological manifestations, such as meningoencephalitis, acute disseminated encephalomyelitis, transverse myelitis and Guillain-Barre syndrome, have been reported in association with dengue virus infection. Dengue virus is a frequent cause of meningitis and is a common neurological manifestation, ranging from 5% to 8.35% of dengue infections. However, dengue meningitis has a benign outcome similar to other types of viral meningitis.

Conclusion
This case report demonstrates that meningitis can be the first manifestation of dengue infection. In endemic areas, dengue infection should be considered and tested as a probable aetiological agent of viral meningitis. Regular monitoring of platelet count and detection of dengue IgM or NS1 antigen in serum and CSF may help in reaching correct diagnosis.

Abbreviations list
CSF, cerebrospinal fluid; NS1 antigen, non-structural protein 1 antigen

Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal.

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References