An unusual case of brainstem encephalitis

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Dengue is the commonest arboviral infection that affects mankind. Infection by any of the four serological types of dengue viruses (DENV-1 to 4) cause dengue fever (DF), dengue haemorrhagic fever (DHF) or dengue shock syndrome (DSS). In recent years, there have been reports of neurological complications associated with dengue in Asia and South America, though their frequency still remains unknown. The encephalopathy associated with dengue infection has been postulated to be due to prolonged DHF with fluid extravasation, cerebral oedema, hyponatremia, liver failure, renal failure and a possible direct neurotropic effect of dengue virus. Though central nervous system (CNS) manifestations have been reported in adults, reports in children are rare and have only been reported in three studies, and none from India. We studied a 10-year-old girl who presented with brainstem encephalitis, thrombocytopenia, elevated liver transaminases and positive dengue IgM with complete resolution of her symptoms within three days of the onset of the disease.

Case report

A 10-year-old girl born of non-consanguineous marriage presented in monsoons with fever since eight days, projectile vomiting since five days, altered sensorium, inability to stand and squint since day 1. Her younger brother was also admitted with fever and was diagnosed to have dengue. She had no convulsions. On examination, she was conscious and oriented and had meningeal signs with positive Macewan’s sign. Her vital parameters were normal. Fundus showed papilledema. She had right lateral palsy and tone and power were normal. Deep tendon reflexes were brisk and right planter was extensor. She had ataxia with intention tremors. Other systemic examination was normal. Thus, she was suspected to have brainstem encephalitis or posterior fossa tumor with raised ICT. Her haemogram revealed thrombocytopenia (platelet 84 000/cumm) with normal haemoglobin and WBC count. Liver transaminases were deranged (SGOT = 121 IU/L), SGPT = 60 IU/L); serum electrolytes, renal function tests and blood sugar was normal. MRI brain did not show any space-occupying lesion and showed only inflammatory changes in right maxillary, ethmoid and sphenoid sinuses. With MRI ruling out posterior fossa tumor, cerebrospinal fluid (CSF) analysis was done which showed aseptic meningitic picture (3 polymorphs, 19 lymphocytes/cumm; 52 mg/dl – sugar; proteins = 10.3 mg %). CSF culture was negative. In view of thrombocytopenia, deranged liver enzymes and meningitis and her brother suffering from dengue, her dengue IgM
by capture ELISA was done, which was positive \{1.2 OD units (positive = > 0.9 OD units)\}. Blood culture and leptospira IgM ELISA were negative. Thus, this child was diagnosed as a case of dengue brainstem encephalitis. She was treated with Mannitol and all her symptoms resolved within three days. Her repeat platelet count and liver transaminases were normal. Thus, here is a case of dengue presenting as brainstem encephalitis.

**Discussion**

Dengue virus is a member[2] of the *Flaviviridae* group of viruses, which include a number of neurotropic viruses such as Japanese encephalitis virus, St. Louis encephalitis virus and tick-borne encephalitis virus. In recent years, we and others have reported neurological manifestations in patients with DHF and DSS characterized by depression of consciousness with normal CSF analysis[1,10] and complete recovery in survivors. In fact, in a study published by us, we found that almost 48.7% of patients had altered sensorium on presentation with higher predominance in the DSS group as compared to the DHF group (77.8% vs 25%, P = 0.0035). However, most of the patients had additional features such as bleeding manifestations, hepatomegaly and serositis. Isolated CNS involvement is a rarity as seen in our patient.

The encephalopathy was thought to be due to cerebral oedema, anoxia, haemorrhage, hyponatremia, hepatic failure, microcapillary haemorrhage and release of toxic substances.[1] However, recent reports have demonstrated a possible direct neutropic effect of dengue virus[9] and localized invasion of the CNS. Similar localized CNS manifestation in the form of brainstem encephalitis with raised intracranial tension and CNS leukorrhia was seen in our patient. A case report by Lum et al. has isolated dengue virus (DENV-2 and 3) from the CSF of affected patients, suggesting direct invasion of the brain and neurovirulent properties of the dengue virus.

Cam et al.[1] have determined that patients with dengue encephalitis have significantly elevated liver enzymes with cerebral oedema. Similar findings were noted in our patient where the child had elevated liver transaminases and complete CNS recovery with Mannitol. In fact, in our patient, the presence of thrombocytopenia with history of her brother suffering from dengue made us suspect dengue encephalitis. In a previous study, we had found that 92.3% of patients affected by dengue had thrombocytopenia, and this combination of thrombocytopenia, elevated liver transaminases and fever is very characteristic of dengue in Mumbai.[10]

Thus, it would be wiser to investigate patients with encephalitis and encephalopathy in dengue-endemic areas for dengue infection, irrespective of the fact whether they have other features of the disease or not.

**In conclusion**, it can be stated that dengue encephalitis is rare but neutropism of the virus is known. It can masquerade as other types of viral encephalitis, but its clinical course and outcome is usually favourable.

**References**


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