

Transverse myelitis in association with dengue infection

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Abstract

A 14 years old girl presented with an acute illness of fever and paraplegia with spinal sensory level at T5-T6. Investigations showed thrombocytopenia, raised serum IgM to dengue virus and normal spinal MRI. This is the first reported case of transverse myelitis associated with dengue fever. The pathophysiological mechanism is postulated to be direct viral invasion of the spinal cord or auto-immune demyelination.

Key words: Myelitis, transverse; dengue.

INTRODUCTION

Acute transverse myelitis denotes an acute intramedullary dysfunction of the spinal cord, involving both halves of the cord. The neuropathological processes that give rise to this syndrome include a periinfectious, postinfectious, or vaccinal process; demyelination as part of multiple sclerosis; vascular insufficiency; idiopathic or paracarcinomatous necrosis; direct infection by virus; irradiation; and vascular malformation.¹ It is a condition imprecisely defined with the definitions differing among the different authors.¹⁻⁵ We have previously set out the clinical diagnosis criteria as: onset of illness < four weeks, both sensory and motor involvement, the motor involvement is both severe and bilateral, there is a sensory level and sphincteric disturbance.⁵

Dengue fever/dengue hemorrhagic fever is an important problem in South East Asia. Dengue fever has a protean manifestation and neurological involvement is now increasingly reported.⁶ However, to-date there has not been previous report of transverse myelitis in association with dengue infection. This is a report of such a case seen recently in the University of Malaya Medical Centre.

CASE REPORT

TMS was a 14 year old student of ethnic Chinese origin residing in a middle-class suburb in Petaling Jaya which is a town immediately adjacent to Kuala Lumpur within the Kelang Valley. She presented to the University of Malaya Medical Centre in June 1995 with a week's history of fever, headache, backache and joint pain. A day before admission, she developed

weakness of both legs and was unable to walk, and to pass urine. She was previously in good health with no past medical and family history of note.

On examination, she was febrile (39 degree Celsius). There was no skin rash, lymphadenopathy, splenomegaly or hepatomegaly. The respiratory and cardiovascular systems were normal. On examination of the nervous system, she was conscious, orientated but drowsy. Her neck was supple and there was no papilloedema. The cranial nerves were intact. The upper limb power was normal with normal tone, reflexes and sensation. On examination of the lower limbs, the power of the hip flexors and extensors, knee flexors and extensors both sides were grade 2/5, while the ankle flexors and extensors were grade 1/5. The muscle tone was flaccid with no clonus. Both knee jerks were exaggerated while the ankle jerks were depressed. The plantar reflexes were upgoing bilaterally. Abdominal reflexes were lost and the bladder was palpable. Sensory level to pin prick was at the level of T5-T6. Position sense in the toes both sides were lost.

Initial investigation showed platelet count of 72,000 /cubic mm, hemoglobin of 11.8 gm%, WBC of 8,700/cubic mm, packed cell volume was 0.34. Liver function test, serum electrolyte, urea and creatinine were all normal. Examination of the cerebrospinal fluid showed a clear fluid with opening pressure of 15cmH₂O, no red blood cell, white blood cell of 6/cubic mm.(all lymphocyte), sugar 3.0 m.mol./l, and protein of 62 mg%. There was no organism seen with microscopic examination. CSF culture for bacteria was negative. Indian ink stain and antigen test for cryptococcus were also negative.

IgM to dengue virus was positive in blood on three occasions, the HI Index titre was >10,240. MRI of the cervical and thoracic spine was also normal.

The patient was diagnosed to have dengue fever with associated transverse myelitis. She improved with symptomatic treatment. On discharge two weeks later, the power of both lower limbs and sphincteric function had returned to normal. Her platelet count had increased to 170,000/cubic mm. The patient remained well two months later during follow up.

DISCUSSION

A febrile illness with transient decrease in platelet count and positive IgM and high IgG titre to dengue suggests that this patient had a dengue infection.⁷ Dengue fever is caused by dengue virus which are member of the flaviviridae. There are four serotypes isolated to date and it primarily affects man. It is transmitted by aedes species mosquitoes. Humans are uniformly susceptible and are not influenced by sex or race.

Neurological manifestations has been reported with dengue. The neurology features seen include headache, dizziness, neck stiffness, seizures, confusion, coma and paresis.^{6,8-10} Delayed neuropathy as postinfectious phenomenon has also been reported.¹¹

Multiple factors has been postulated to be responsible for the pathophysiological mechanism of neurological dysfunction in dengue fever. Abnormal hemostasis in dengue is due to vasculopathy, qualitative and quantitative platelet dysfunction, and coagulopathy.¹² Bhamarapavati et al¹³ only found two cases of cerebral focal bleeding in 100 autopsies. Leakage of plasma into serous spaces and abnormal hemostasis causes hypovolemic shock, hypoxia and metabolic acidosis. Disseminated intravascular coagulation may cause cerebral damage by occluding the blood vessels. Hyponatremia may be another contributing factor. Convulsion is able to lead to a cascade of events aggravating the cerebral damage. Liver failure may be another factor aggravating the CNS manifestation.⁸ There has also been report of breakdown of blood-brain barrier occurring in mice inoculated intracerebrally or intraperitoneally with dengue virus.¹⁴ This would be able to cause cerebral oedema. Reports of isolation of dengue virus, detection of polymerase chain reaction, dengue immunoglobulin M assays in CSF indicates that

the virus is able to directly invades the brain and cause encephalitis.^{15,16} Occurrence of delayed neurological manifestation¹¹ suggests autoimmune demyelination may be a further mechanism for the neurological damage.

In this particular patient, the clinical picture was that of near complete loss of spinal cord function at T5-T6 level. This occurred with lowest platelet count at 72,000/cubic mm and no clinical sign of abnormal hemostasis. There was also no clinical evidence of plasma leakage into serous space and hypotension. The patient was well systemically with no evidence of acidosis. The spinal MRI at the corresponding level was also normal. All these suggests that bleeding and other systemic factors are unlikely to be the explanation of the patient's transverse myelitis. On the other hand, a direct invasion by the virus or autoimmune demyelination are the more likely explanations. Unfortunately, further tests to demonstrate the presence of the virus in the CSF was not done.

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