

Dengue Encephalopathy with Transient Splenial Hyperintensity on MRI Brain in a Child: A Case Report

Thahseen Nilofar S¹, Ahamed Ashar Ali H²

Author Affiliation: ¹Consultant Pediatrician, Vadamalayan Hospitals, Madurai, Tamil Nadu 625002, India.
²Consultant Anaesthesiologist, Meenakshi Mission Hospital and Research Centre, Madurai, Tamil Nadu 625107, India.

Corresponding Author: Ahamed Ashar Ali H, Consultant Anaesthesiologist, Meenakshi Mission Hospital and Research Centre, Madurai, Tamil Nadu 625107, India.

E-mail: dr7ahamed@gmail.com

Received on 09.10.2019,

Accepted on 09.11.2019

How to cite this article:

Thahseen Nilofar S, Ahamed Ashar Ali H. Dengue Encephalopathy with Transient Splenial Hyperintensity on MRI Brain in a Child: A Case Report. Indian J Trauma Emerg Pediatr. 2019;11(4):117-119.

Abstract

Background: Neuroradiological findings in Dengue are nonspecific. Only a few cases of transient splenial hyperintensity (TSH) in MRI Brain due to dengue fever have been reported. We report a case of 13-year old boy with acute febrile illness, delirium and severe headache who was diagnosed with dengue encephalopathy; neuroimaging showed transient splenial hyperintensity (TSH). *Conclusion:* Complete clinical recovery was achieved with symptomatic management.

Keywords: Dengue encephalopathy; Transient splenial hyperintensity.

Introduction

Dengue fever represents a significant disease burden in the tropics. Neurological manifestations such as encephalopathy/encephalitis can be associated with dengue. We report a case of dengue encephalopathy in a young boy having transient signal change in the splenium of corpus callosum on MRI Brain. This is probably the first pediatric case from Tamil Nadu reported to have TSH/MERS due to dengue infection.

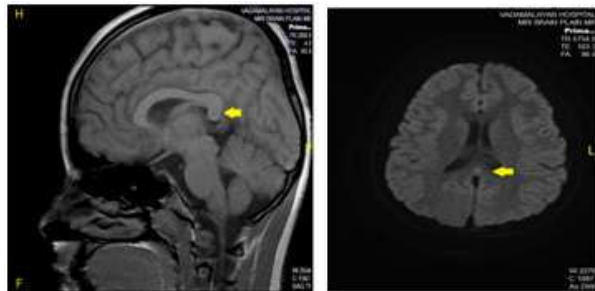
Case Report

A previously well 13-year-old boy presented with a three-day history of high-grade fever, associated with severe headache and delirium since day-2 of illness. His general examination was normal. There was no neurological deficit at admission. His vitals were within normal limits for age and examination of systems showed no significant abnormality. His blood count was significant for leucopenia with total count being 2800 cells/cu.mm of blood and normal Platelet count of 3.08 lakh/cu.mm of blood. His Blood sugar, serum electrolytes, coagulation profile and liver function tests were within normal limits. On Day 2 NS1(Non structural) Antigen test (ELISA method) was positive. Diagnosis of dengue with toxic encephalopathy was considered. He was managed symptomatically. He did not develop hemoconcentration, thrombocytopenia or any warning signs associated with severe dengue.

In view of severe persistent headache, neuro-imaging was done on Day 5 of illness. MRI Brain showed a well-defined lesion of size 6.4 mm x 6 mm with restricted diffusion in the splenium of corpus callosum, which suggested transient splenial

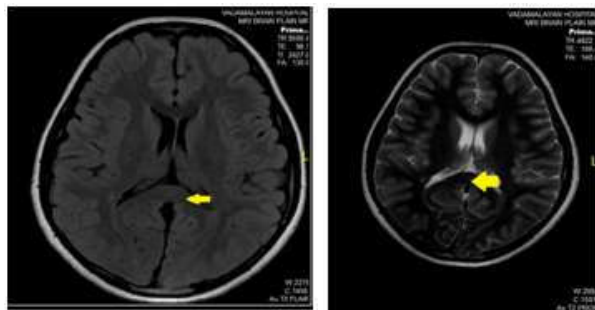
hyperintensity (TSH). IgM dengue by qualitative ELISA method done on Day 5 was subsequently positive and IgG was negative. He made a complete recovery on Day 7 of illness. He was diagnosed as having transient splenial hyperintensity (TSH)/mild encephalitis/encephalopathy with a reversible splenial lesion (MERS) by virtue of MRI features and the mild clinical course.

This case highlights the importance of considering dengue encephalopathy in patients from endemic areas presenting with acute febrile illness and neurological symptoms, especially during an outbreak. This is probably the first pediatric case from Tamil Nadu reported to have TSH/MERS due to dengue infection.



A. T1 sagittal image with hypointense changes

B. DWI Axial image showing hyperintense changes in mid splenium (central Dot sign)



C. T2 FLAIR Axial image with hyperintense changes (arrow)

D. T2 PROP Axial image with hyperintense changes

Fig. 1: MRI Brain images of 13-year-old boy diagnosed with MERS following Dengue infection.

Discussion

Dengue infection rate has reached alarming proportions with 25,000 fatalities every year.¹ Neurological involvement occurs in 4–5% of dengue infections. Most common neurologic manifestation of dengue fever is encephalitis.²

The predominant presentation of altered sensorium with or without seizures is attributed to multiple factors such as hepatic encephalopathy, dyselectrolytemias, cerebral hypoperfusion, and cerebral edema. Traditionally, this virus was considered as non-neurotropic. However, many recent reports have established possible true encephalitis with neuroinvasion.

TSH/MERS can be seen in a host of conditions both systemic and neurological as an evanescent finding of questionable clinical significance. The factors causing TSH in dengue encephalopathy could be a breach of the blood-brain barrier and osmotic and inflammatory injury leading to intramyelinic oedema or microvascular leak.³ Transient encephalopathy improves with supportive care. No correlation has been observed between the degree of diffusion restriction and clinical course. TSH is an isolated, silent, reversible lesion and it should not be mistaken for something more alarming.⁴ These are usually asymptomatic and do not produce features of disconnection syndromes. They are fully reversible and disappear after few weeks causes of MERS (Table 1).⁵

Table 1: Causes of MERS

Metabolic	Electrolyte imbalance, Hepatic encephalopathy, Hypoglycemia
Infections	Viral (e.g. Influenza, Measles, Herpes, Mumps, Adenovirus, Varicella zoster, Rotavirus) Bacterial (e.g. <i>Salmonella</i> , Legionnaires' disease -Mycobacterial (e.g. Tuberculous meningitis)
Others	Seizures, CNS malignancy, Drugs and Toxins, Subarachnoid haemorrhage.

Cascade of cytokines result in a massive increase in glutamate in the extracellular fluid causing an influx of water into both astrocytes and neurons which manifests as cytotoxic edema. The reason, the splenium is preferentially affected is due to the presence of a high density of oligodendrocytes expressing large numbers of glutamate receptors.⁵

Clinical presentation relates to the underlying pathology rather than to the callosal lesion itself. The term cytotoxic lesions of the corpus callosum (CLOCCs) has been proposed recently as a more precise description of this phenomenon which has previously been known by a various terms including transient lesions of the splenium of the corpus callosum, mild encephalitis/encephalopathy with a reversible isolated SCC lesion (MERS), reversible splenial lesions and reversible splenial lesion syndrome (RESLES).

CLOCCs do not demonstrate convincing signs or symptoms of hemispheric disconnection, such as pseudo-neglect, alien hand syndrome, apraxia, agraphia, and alexia. Some studies have shown that patients generally recover completely on MRI studies within one month, mostly within one week following the neurological recovery.

Conclusion

Our case report widens the neurological manifestations associated with dengue infection and reiterates that patients with MERS should be managed supportively as the splenial white matter tracts are reversibly involved in MERS. Though it is commonly reported in adults due to various etiology, this radiological finding is rare in children.

Conflicts of interest: There are no conflicts of interest.

References

1. Jekel JF, Katz DL, Elmore JG, *et al.* Epidemiology, biostatistics and preventive medicine. Elsevier Health Sciences; 2007 Jun 26.
2. Solomon T, Dung NM, Vaughn DW, *et al.* Neurological manifestations of dengue infection. The Lancet. 2000 Mar 25;355(9209):1053–9.
3. Sureshbabu S, Khanna L, Peter S, *et al.* The brightening splenium: An imaging hallmark of dengue encephalopathy? Annals of Indian Academy of Neurology. 2016 Oct 1;19(4).
4. Mathew T, Badachi S, Sarma GR, *et al.* Dot sign'' in dengue encephalitis. Annals of Indian Academy of Neurology. 2015 Jan;18(1):77.
5. Starkey J, Kobayashi N, Numaguchi Y, *et al.* Cytotoxic Lesions of the Corpus Callosum That Show Restricted Diffusion: Mechanisms, Causes, and Manifestations. Radiographics: a review publication of the Radiological Society of North America, Inc. 2017;37(2):562–76.

