

# MRI Imaging of Dengue Encephalitis

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**ABSTRACT:** Dengue is a major health problem and is a hemorrhagic fever leading to hospitalization and death may ensue. This disease is most prevalent in South East Asia –India, Bangladesh, Sri Lanka, Indonesia, Myanmar, Thailand and Maldives. Dengue infection is endemic in many tropical countries and its incidence is shooting up at an alarming rate. The important neurological complications are encephalopathy and encephalitis, the former being more prevalent. Following serological and CSF examinations, imaging with CT or MRI is highly important to look for structural alterations in brain to define the pattern and extent of involvement of brain parenchyma if persistence is established. The role of MRI imaging has become indispensable to evaluate the structural malformations in the brain and thereby fairly establishing and assessing the prognosis of the patient side by side.

**Keywords:** MRI, Dengue fever, Encephalitis, Hyperintensity, Encephalopathy and Cerebral parenchyma

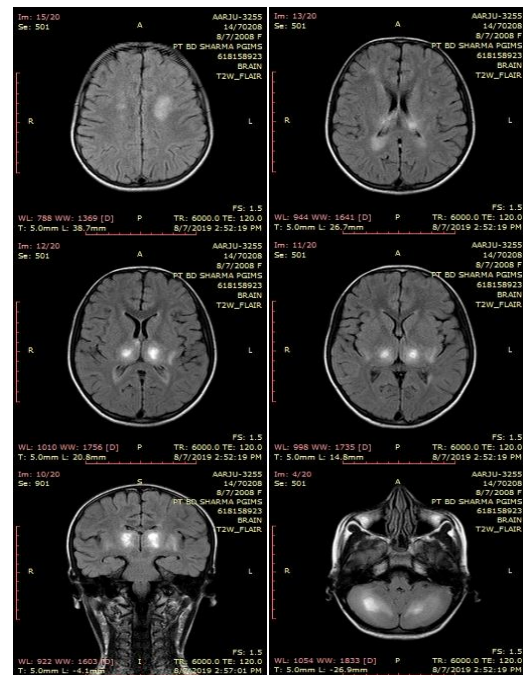
## Introduction

Dengue viruses, being arbovirus associated with ssRNA and 4 serotypes (DEN-1,2,3,4) are single stranded viruses of Flaviviridae family, which can simultaneously trigger dengue fever and dengue hemorrhagic fever. A myriad of systemic structural changes may occur and the neurological manifestations play a vital role in increasing the rate of mortality and morbidity. Here we report a case of child suffering from serologically approved dengue fever showing peculiar features of dengue encephalitis on imaging. This report determines the critical role of imaging in further detecting dengue fever emphatically with neurological manifestations. Specific life is contained in each serotype having immunity and cross immunity. Peculiar genetic variants within each serotype emerge as more virulent due to higher epidemic potential.<sup>1,2</sup>

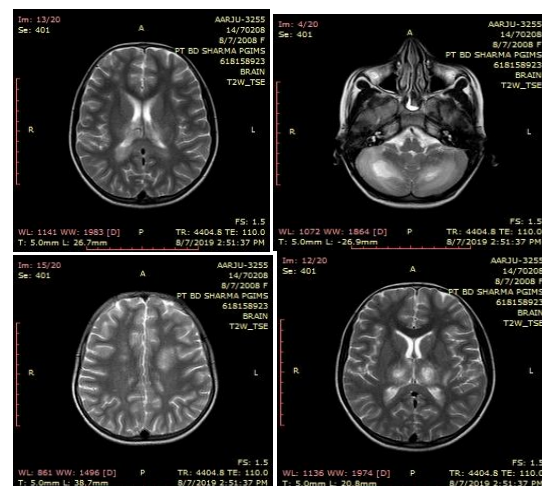
## RESULTS

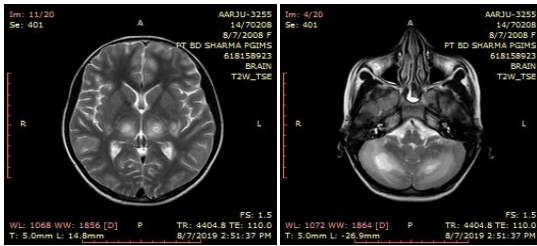
Case : A girl, aging 11 yrs visited the emergency department with history of high-grade fever for 8 days, seizures for 4 days and altered sensorium for 3 days. Glasgow Coma Scale of the afflicted patient was found to be ‘6’ during admission and

simultaneously during thorough check up. CSF examination showed evidence of dengue antigen, protein 7.8 mg/dl and differential count showing 100% lymphocytes.

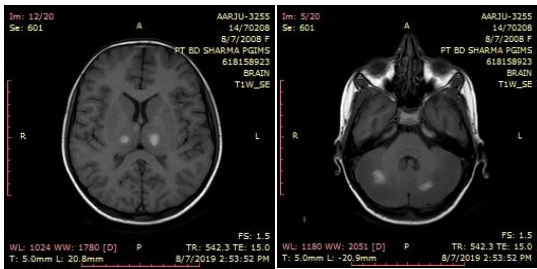


MRI FLAIR IMAGES

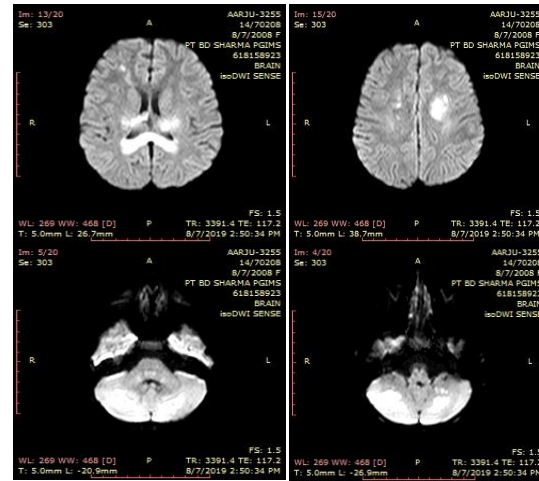
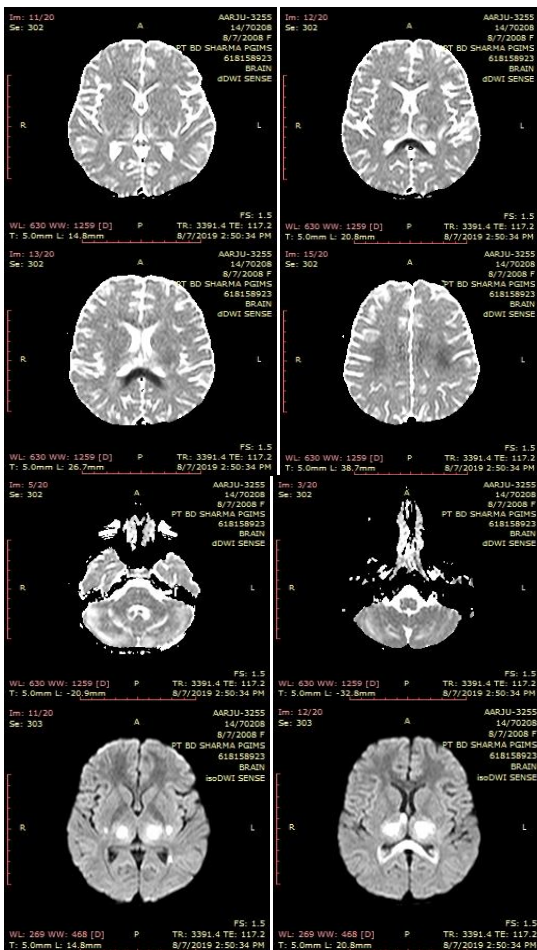




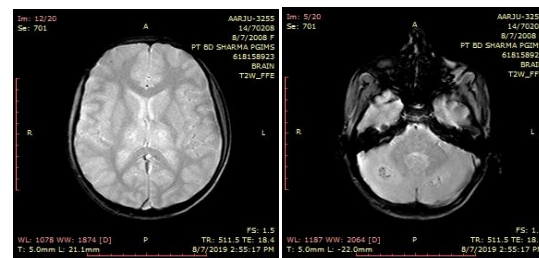
MRI T2 W IMAGES



MRI T1 W IMAGES



MRI DWI AND ADC IMAGES



MRI FFE IMAGES

MRI images of 11 year old female patient demonstrates Dengue Encephalitis : There is T1 ,T2 , FLAIR hyperintensities noted in bilateral thalami , splenium of corpus callosum, bilateral centrum semiovale( L>R ) , bilateral corona radiata and bilateral cerebellar hemisphere showing diffusion restriction on DWI and ADC images. The lesion in B/L cerebellar hemisphere shows blooming on FFE images.

Laboratory findings showed a platelet count of 80,000 and serum was positive for IgG and IgM dengue antibodies and negative for Japanese encephalitis virus, malarial parasite and hepatitis A, B, C.

### Discussion and conclusion

When a serologically confirmed patient with proven dengue comes to notice revealing salient features of encephalitis then not ruling out the possibility of encephalitis, the patient has to be observed and examined on priority basis and imaging has to be conducted on priority basis to mitigate suspicion. The involvement of brain in dengue fever may be contained in the form of encephalopathy or encephalitis. Encephalopathy is more prevalent and can emerge with multi-system derangement like Coagulopathy, hepatic failure, bacterial infections and shock. In our case of encephalitis, MRI imaging reveals the multiple

focal lesions in cerebral parenchyma, cerebellum, and brainstem along with the bilateral thalamic involvement. To rule out other differential diagnosis in the treatment of the serious patient, MRI is the most sensitive modality and the imaging method of choice with perceivable advantages as it can provide better visualization of brain structural anatomy and quite superior in proper displaying the posterior fossa anatomy. This pattern of brain involvement had been typically mentioned especially in case of Japanese encephalitis. But recently case reports with similar brain lesions with regards to dengue encephalitis too have been displayed and reported. Therefore, imaging has been found to be highly vulnerable and essentially significant to confirm or to establish the presence of encephalitis, a peculiar ailment and rule out with solid reasons. Bilateral thalamic involvement with evidence of hemorrhage in dengue fever, similar to the cited case has already been mentioned.<sup>1,2,3</sup>

#### **Acknowledgement**

No words can ever express my deep sense of gratitude for my parents & my younger brother, for their affections, endurance, inspiration, support, unending blessings, innumerable sacrifices and unceasing encouragement that has moulded me into the person i am today. the expression of my gratitude's will remain incomplete if i fail to register my deep sense of indebtedness to my family members without whose perseverance and affection it would have not been possible for me to undertake this arduous assignment.

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Conflict of interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

#### **Bibliography**

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