

## Dengue Encephalitis - Case Series

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### ABSTRACT

Dengue fever is one of the most common arboviral infections, and it is the world's fastest-spreading tropical illness. According to the World Health Organization, fifty million cases of clinical dengue infections occur each year, posing a significant public health hazard, primarily in Southeast Asia and the Western Pacific. Since the first report of Dengue infection with acute encephalopathy was reported in 1976, there have been reports from numerous Southeast Asian nations. We present three cases of dengue fever from southern India that presented with encephalitis-like symptoms in this report. The diagnosis of dengue was supported by serum dengue antibody levels. Three patients were examined, and it was discovered that the neurological findings of each patient varied. One of the patients had typical MRI brain findings, primarily involving the bilateral thalami, the other's computed tomography scan revealed cerebral edema, and the third patient had no significant neurological findings at all. We present this case because, to prevent negative outcomes and improve patient quality of life through early detection, dengue encephalitis should be considered when making a differential diagnosis of fever with decreased sensory function, particularly in countries like India where dengue is endemic.

**Keyword:** dengue encephalopathy, dengue, dengue hemorrhagic fever

### INTRODUCTION

Dengue is caused by a dengue virus of single – stranded RNA virus belongs to the family Flaviviridae causing dengue fever and dengue hemorrhagic fever. The virus has four separate but closely related serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) among them DENV-2 and 3 are the major serotypes that lead to neurological disorders <sup>[1]</sup>. As of December 31, 2022, according to the European Center for disease prevention and Control, 110473 dengue cases have been reported from India <sup>[2]</sup>. A relatively frequent neurological effect of dengue illness is encephalopathy. Usually, many system disturbances such as shock, hepatitis, coagulopathy, and concomitant bacterial infection lead to

dengue encephalopathy. Dengue Encephalitis is rare and occurs as a result of directly invading neurons leading to neuronal infiltration by dengue virus <sup>[3]</sup>. Dengue encephalitis is thought to be benign but can be fatal at times.

Asymptomatic infection to dengue shock syndrome is the clinical spectrum of dengue fever. The dengue virus, in contrast to other arboviral infections, rarely results in neurological symptoms. Dengue, however, has been linked to neurological symptoms in recent years. The neurological manifestations seen in dengue are encephalitis, meningitis, and encephalopathy, stroke, and Guillain-Barré syndrome. Dengue encephalitis is an extremely rare disease, the incidence being

about 4-5% only. The most frequent symptom of dengue encephalitis, which occurs in 52.3% of patients, is alteration of consciousness, headache, and seizures. [4, 5]

The diagnosis of Dengue encephalitis shows bilateral thalamic involvement with positive IgG /IgM in CSF for dengue virus. PCR for confirming the viral RNA is required. CT scan shows hyperattenuating intraparenchymal foci representing spontaneous microhaemorrhages are commonly seen. MRI findings in dengue vary. MRI may be normal but haemorrhages cerebral edema, and focal abnormalities involving the hyperintense lesion involving basal ganglia, thalamus, cerebellum and hippocampus are the classical features of Dengue Encephalitis. A characteristic involvement of dengue Encephalitis is bilateral thalamic with central area hemorrhage gives characteristic Double Doughnut Sign. Supportive therapy and symptomatic management are the treatment of Dengue Encephalitis.

### CASE 1

A 15-year-old male presented with complaints of continuous high-grade fever associated with chills and not associated with rash, myalgia, 3 episodes of non-projectile vomiting with food and water, 5 episodes of seizures with tongue bite and up rolling of an eye, regained consciousness in between episodes and postictal confusion since 4 days, altered sensorium since 3 days. On examination, the patient was found to be stupefied, afebrile, and had a GCS of E2V1M3. On investigation, hemoglobin (Hb) - 11.9 g/dL, Platelet count (PLT) - 27,000/cumm, White Blood count (WBC) - 4,750/cumm with Neutrophils- 65.9%, Lymphocytes-25.9%, Monocytes- 7.8%. The liver function test was abnormal urea-66, ALT- 403, and AST-194, sinus tachycardia on ECG. The patient came out with DENGUE NS1, IgM Ab was positive. Acute hemorrhagic infective encephalitis demyelination was suggested by the thickened and edematous lesions on the MRI brain that were seen in the post-CG

region, the cerebral hemisphere, and the B/L thalamus. Based on the findings of the investigations, the patient was diagnosed with dengue encephalitis.

The patient was initially managed with anti-epileptics (levetiracetam 500mg), antibiotics (ceftriaxone 2g, doxycycline 100mg), acyclovir 500mg, and dexamethasone 8mg, the platelet count was maintained with RDP transfusions. Due to the patient's declining state and GCS scores, the patient was intubated and ventilated. After five days, the patient was extubated and his condition began to improve. The patient developed intermittent fever, a productive cough, constipation, GTCS-type seizures, hypotonia of neck muscles hyporeflexia of UL, and areflexia of LL resulting in areflexic quadriparesis. The investigations on nerve conduction were normal. The patient was subsequently given supportive care, including dexamethasone, antibiotics, and antiepileptic drugs, physiotherapy was suggested. The patient was discharged with minimal improvement.

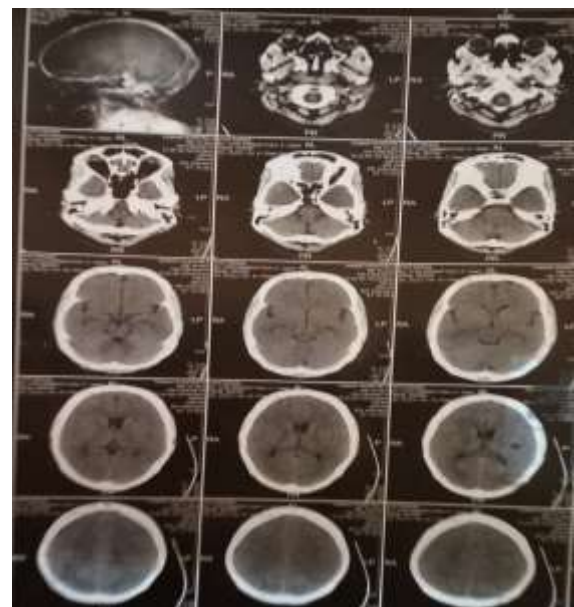


Fig 1: MRI brain observations in the post-CG region, thickened and edematous lesions on the brain, cerebral hemisphere, and the B/L thalamus.

### CASE 2

A 38-year-old woman presented with a high-grade fever associated with chills, rigors, burning micturition for 4 days,

headache in occipital and neck region for 5 days, 5 episodes of non-projectile vomiting with food, GTCS-type seizures with up rolling of eyes, tongue bite and loss of consciousness, regained consciousness after 2-3mins, postictal confusion, altered sensorium since 2days, yellowish discoloration of eyes associated with abdominal pain and hypochondriac discomfort since 7days. The patient was drowsy, had a GCS of E2V1M6, experienced neck stiffness, a SpO<sub>2</sub> of 96% RA, and a blood pressure reading of 110/80 mmHg. The patient had a history of using herbal medications 5 days ago for jaundice. Investigation revealed the following values of hemoglobin (Hb)- 9.4 g/dL, Platelet count (PLT)-1.22 lac/cumm, White Blood count (WBC)- 15600 /cumm with Neutrophils- 64%, Lymphocytes-31%, Monocytes- 4.1%. The liver enzymes were elevated including urea- 38, ALT-135, AST- 62, ALP- 159, the CRP was 48, INR was 1.3 and DENGUE NS1, IgM Ab test was positive. The CT Brain revealed cerebral edema. The spot urine proteins- 65mg%, spot urine creatinine- 108mg%, and proteins/creatinine ratio- 0.6. The patient was determined to have dengue encephalitis based on the investigation findings.

The patient was managed with anti-epileptics (levetiracetam 500mg), antibiotics (ceftriaxone 2g), and acyclovir 800mg, dexamethasone 4mg, and intravenous fluids.

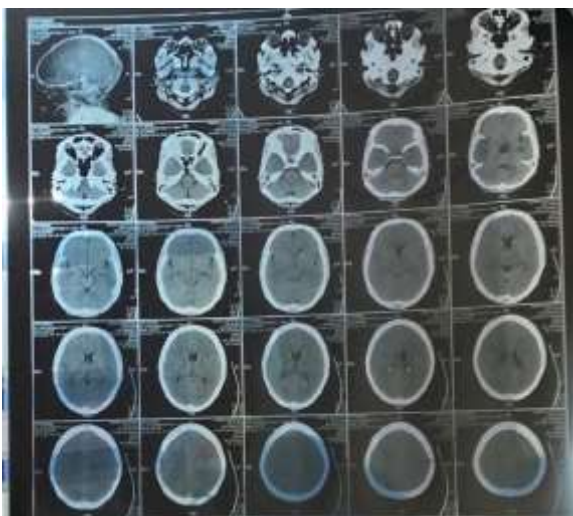


Fig 3: The CT Brain revealed cerebral edema.

### CASE 3

A 30-year-old male patient presented with chief complaints of high-grade fever (102°F), associated with chills for the last 2 days, and Hematuria for 1 day. There is no history of rash, bleeding from any site, cough, or coryza. No history of any limb weakness or cranial nerve deficit. History of Dengue (Igm +ve), Chikungunya (+ve), altered sensorium, seizures (injection - lorazepam-2mg IV sos). Physical examination of the patient was cooperative, incoherent, neck rigidity, Blood pressure - 160/100mmHg, PR-106b/min, SPO<sub>2</sub>-82 decrease in radial artery (RA), CVS - S1S2(+ve), RS-BAE(+ve), No pallor icterus, bilateral pupils were normally reacting with light, Normal Tone. No evidence of any Weakness and deep tendon reflexes were elicited normally. The patients Laboratory findings were CRP-Positive, HBsAG-negative, malaria-PF/PV negative, Dengue-NS1 positive, IGM-equivocal, widal test negative, CT-scan brain and spinal cord normal. CSF fluid analysis – proteins (87.5mg/dl), sugar (44mg/dl), culture-sensitive test-organism isolated - Pseudomonas aeruginosa isolated in culture 10<sup>5</sup> units cells unit/ml, ultrasound scan of Abdomen-r/o cystitis, spot PCR was done, MRI-T2: hypertense. Based on the investigation findings, the patient was determined to have dengue encephalitis, complicated UTI with cystitis with AKI in sepsis. The patient was managed with Inj. Acyclovir-500mg IV TID, Inj. piptaz- 2.25gm IV TID, Inj.Rantac-50mg IV BD, anti-epileptics (Inj. levetiracetam 500mg) BD, IVF fluids, Inj.Thiamine -100mg IV OD, Inj. Dexamethasone - 6mg IV TID, Inj.paracetamol-1gm IV TID monitor vitals.

Days	Day 1	Day2	Day3	Day4
WBC	14.73	12.01	17.43	20.84
HGB	15.1	14.1	14.2	10.7
PLT	116000	79000	128000	82000
RBC	5.09	4.71	4.83	3.66
Sr creatinine	7.8	3.14	1.8	0.85

Table 1: The above table describes the hematology and urine examination reports.

## DISCUSSION

Dengue virus infections have become the leading cause of hospitalization in Telangana. Every year, approximately fifty to one hundred million illnesses and 25,000 deaths are predicted to occur all over the world. Severe dengue infection is usually characterized by high hematocrit levels, a rash, internal bleeding due to thrombocytopenia, shock, altered electrolytes, cerebral edema, liver failure, and other organ failures<sup>[6]</sup>. Along with these signs and symptoms, some people experience involvement of the cerebrospinal fluid (CSF) and ocular damage, and due to the neurotrophic effects of the dengue virus and its association with the central nervous system, this might result in the development of dengue encephalitis in severe cases<sup>[6,7]</sup>.

Even though neurological indications such as encephalitis, meningitis, seizures, and flaccid paralysis were initially noted as unusual symptoms of dengue infection in 1976, yet, they were well-documented neurological symptoms from 25 nations spanning practically every continent, ranging in age from 3 months to 60 years with annual incidence varying from 0.5 to 20% in current history<sup>[8]</sup>.

In recent periods it has been observed that dengue encephalitis symptoms are becoming more common in tropical and subtropical countries, with an incidence ranging from 0.5 to 5.0<sup>[9]</sup>, with well-understood pathophysiology of dengue encephalitis as a brief breakdown in the blood-brain barrier integrity brought on by the migration of dengue virus-infected macrophages into the central nervous system (CNS)<sup>[10]</sup>.

Several dengue encephalitis cases do not show any significant CSF findings, MRI or CT scan observations, but few case reports indicate the presence of antibodies in CSF findings in a few patients, suggesting dengue virus is neurotropic, as mentioned in cases by Miagostovich et al<sup>[11]</sup>, and Misra et al<sup>[12]</sup> and in few other reports also indicate the changes observed in the CT and MRI scans.

In this report, patients were presented with symptoms such as fever, vomiting, seizures, confusion, and headache, and all of them were positive for dengue IgM, upon undergoing radiological investigations - MRI brain scans of one patient's post-CG area, cerebral hemisphere, and B/L thalamus showed thickened and edematous lesions, such as in<sup>[6]</sup> and the second patient's CT scan of the brain showed cerebral edema and the third patient had a normal MRI scan observation which also observed in<sup>[9]</sup>. These scan results, symptoms, and other laboratory reports supported the diagnosis of dengue encephalitis in those patients.

In this study, we primarily highlight dengue encephalitis cases where both types of cases - those with abnormal MRI and CT scan observations and those with normal scans - yet the patient nonetheless presented with the symptoms supporting the diagnosis of dengue encephalitis - have occurred.

## CONCLUSION

Flu-like symptoms, dengue hemorrhagic fever, or dengue shock syndrome are the most common manifestations of dengue. Dengue encephalitis should be kept as a differential in patients with a short history of fever and altered sensorium in countries like India where the DF is endemic, especially in the post-monsoon season. Also, clinicians should have a high clinical suspicion level because the prognosis is favorable if treated promptly.

### *Declaration by Authors*

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## REFERENCE

1. Gupta S, Jesrani G, Cheema YS, Kumar V, Garg A. Dengue Encephalitis: A Case Series on a Rare Presentation of Dengue Fever. *Cureus*. 2022; 14 (1):e21615. Published 2022 Jan 25. doi:10.7759/cureus.21615
2. <https://www.ecdc.europa.eu/en/denguemont-hly#:~:text=India%20%3A%20From%20>

- %20January%202022,86%20deaths%20have%20been%20reported.
3. Borawake K, Prayag P, Wagh A, Dole S. Dengue encephalitis. *Indian J Crit Care Med.* 2011;15(3):190-193. doi:10.4103/0972-5229.84896
  4. Chowta N, Laxman M, Mahalingam S. Dengue encephalitis-A rare manifestation of dengue fever. *Asian Pac J Trop Biomed.* 2014; 4 (Suppl 1):S70-S72. doi:10.12980/APJTB.4.2014C1006.
  5. Jasmine Porwal, Ajay Chauhan. Dengue Encephalitis. journal of the association of physicians of India. August-2016. issn 0004-5772 .volume 64.
  6. LNU P, Sehgal V, Bhalla Sehgal L, et al. (September 11, 2022) The Spectrum of MRI Findings in Dengue Encephalitis. *Cureus* 14(9): e29048. DOI 10.7759/cureus.29048.
  7. Borawake K, Prayag P, Wagh A, Dole S. Dengue encephalitis. *Indian J Crit Care Med* 201 1;15: 190-3.
  8. Li G-H, Ning Z-J, Liu Y-M and Li X-H (2017) Neurological Manifestations of Dengue Infection. *Front. Cell. Infect. Microbiol.* 7:449. doi: 10.3389/fcimb.2017.00449.
  9. Madi D, Achappa B, Ramapuram JT. Dengue encephalitis-A rare manifestation of dengue fever. *Asian Pac J Trop Biomed.* 2014;4 (Suppl 1):S70-S72. doi:10.12980/APJTB.4.2014C1006
  10. Porwal J, Chauhan A. Dengue Encephalitis. *J Assoc Physicians India.* 2016;64(8):99-100.
  11. Miagostovich MP, Ramos RG, Nicol AF, et al. Retrospective study on dengue fatal cases. *Clin Neuropathol.* 1997;16(4):204-208.
  12. Misra UK, Kalita J, Syam UK, Dhole TN. Neurological manifestations of dengue virus infection. *J Neurol Sci* 2006; 244:117-22.
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