

A CASE OF HEMORRHAGIC DENGUE ENCEPHALITIS: A RARE PRESENTATION OF DENGUE EXPANDED SYNDROME

MAHMUD R¹, SAYEED SKJB², ISLAM MR³

Abstract:

Dengue encephalitis is a rare manifestation of dengue fever. Headache disorientation and or seizure gives the clinical suspicion of encephalitis in the case of dengue. Hemorrhagic encephalitis has been reported very scarce. Here we reported a case of hemorrhagic encephalitis who presented with fever, severe headache, and disorientation. MRI of the brain revealed early subacute in both temporal and frontal lobes.

DOI: <https://doi.org/10.3329/jdmc.v30i2.56932>

J Dhaka Med Coll. 2021; 30(2) : 232-236

Introduction:

In Bangladesh, Dengue was first documented in 1964.¹ The outbreak of dengue fever has become a regular phenomenon since 2000.^{2,3} It is a flavivirus disease caused by DEN 1, DEN, 2DEN 3, and DEN 4^{4,5} and transmitted with *Aedes aegypti* and *Aedes albopictus*. The outbreak in 2021 started from September 2021, predominantly with the DEN3 serotype.⁶ It confirms the recent post-monsoon epidemiologic shift of the virus outbreak (September–December).⁷

The first neurologic manifestation of dengue fever as encephalopathy was reported in 1976.⁸ Now the estimated neurologic manifestation ranged from 0.5 to 20%.⁹ Dengue virus can be directly neurovirulent, and the DENV-2 and DENV-3 serotypes are mostly related to neurological complications.⁹ The current literature classifies the dengue neurologic complications according to its pathophysiology and sites of involvement. The subtypes are-a. Dengue virus encephalopathy b. Dengue virus encephalitis, c. Immune-mediated syndromes (acute disseminated encephalomyelitis, myelitis,

Guillain–Barré syndrome, neuritis brachialis, acute cerebellitis, and others) d. Neuromuscular complications (hypokalemic paralysis, transient benign muscle dysfunction, and myositis), e. dengue-associated stroke.¹⁰ Dengue encephalitis is a rare complication¹¹ that mainly involves the basal ganglia, hippocampus, and thalamus.¹² Dengue hemorrhagic encephalitis reported in the literature is scarce. Here we have reported confirmed dengue with multiple hemorrhages in the different regions of the cerebral hemisphere.

Case report:

A 50 years old lady was admitted to a public hospital with a history of fever and headache for three days. Her fever was high grade, remittent with no chills and rigor. The headache was persistent, global, throbbing in nature, unremitting by any means, and exaggerated on movements. There was a generalized body ache without any arthralgia or joint swelling. She had several episodes of vomiting, had persistent nausea, and severe anorexia. There were no dysuria and bowel disturbances. She had no

1. Dr. Reaz Mahmud, Assistant Professor, Department of Neurology, Dhaka Medical College

2. Dr. S K Jakaria Been Sayeed, Medical Officer, Stroke Unit, National Institute of Neurosciences & Hospital, Sher-E-Bangla Nagar Dhaka- 1207, Bangladesh

3. Dr. Mohammad Rafiqul Islam, Associate Professor, Department of Medicine, shaheed Suhrawardy Medical college

Correspondence: Dr. Reaz Mahmud, Assistant Professor, Department of Neurology, Dhaka Medical College, E-mail: reazdmc22@yahoo.com Phone: +8801912270803

Received: 26-07-2021

Revision: 20-08-2021

Accepted: 02-09-2021

history of unconsciousness or disorientation and convulsion. On examination, the patient was toxic, fully conscious. Her pulse rate was 88 per minute and regular, and her initial blood pressure was 110/80 mm of mercury. The respiratory rate was 20 per minute, and the temperature was 103 Fahrenheit. There was no organomegaly and abdominal tenderness. The Respiratory and cardiovascular system examinations were within normal. She was fully conscious, had no dysarthria. There was no cranial nerve palsy and no focal weakness. There was positive neck rigidity but absent other signs of meningeal irritation. We immediately sent the CBC and dengue NSI antigen test. It revealed thrombocytopenia and positive NSI antigen. The patient was doing well with the conservative treatment, and the platelet was increasing from the second day of admission.

But she developed confusion and disorientation at her day five of illness (second day of admission). She was conscious but responded delayed with a conversation, but there was no convulsion. We advised an MRI of the brain, and it revealed multiple acute hemorrhages in both frontal and left temporal lobes of the brain. There were hyperintensities in the left parietal lobe. Her platelet count reached to normal level at her 6th day of admission (9th day of her illness), and she maintained her blood pressure with conservative treatments. The patient's drowsiness improved on her day nine of admission and, we discharged the patient in an afebrile state with a slow conversation and platelet count of 1, 74000 cell/mm³. After seven days of her discharge, her confused state recovered. At one month of post-discharge follow-up, she recovered completely.

Investigations:

Table I
Biochemical investigations of the patient

Trait	1 st day of admission	2 nd day of admission	3 rd day of admission	4 th day of admission	5 th day of admission	6 th day of admission
Hemoglobin g/dl	12.5	12.5	12.5	12.5	11.6	11.7
Total leucocyte count cell/mm ³	6300	6700	6300	6700	6300	4700
Neutrophil (%)	55	61	55	61	58	57
Lymphocyte (%)	34	29	55	61	58	57
Total platelet count cells/mm ³	71000	82000	1050000	125000	120000	174000
Hematocrit (%)	36.3	38	36.3	38	34.8	35
S creatinine mg/dl	1.1					
SGPT (unit/L)	75					
APTT (seconds)			36			
PT (seconds)			13			
Sodium (mmol/L)	143	140				
Potassium (mmol/L)	3.9	3.7				

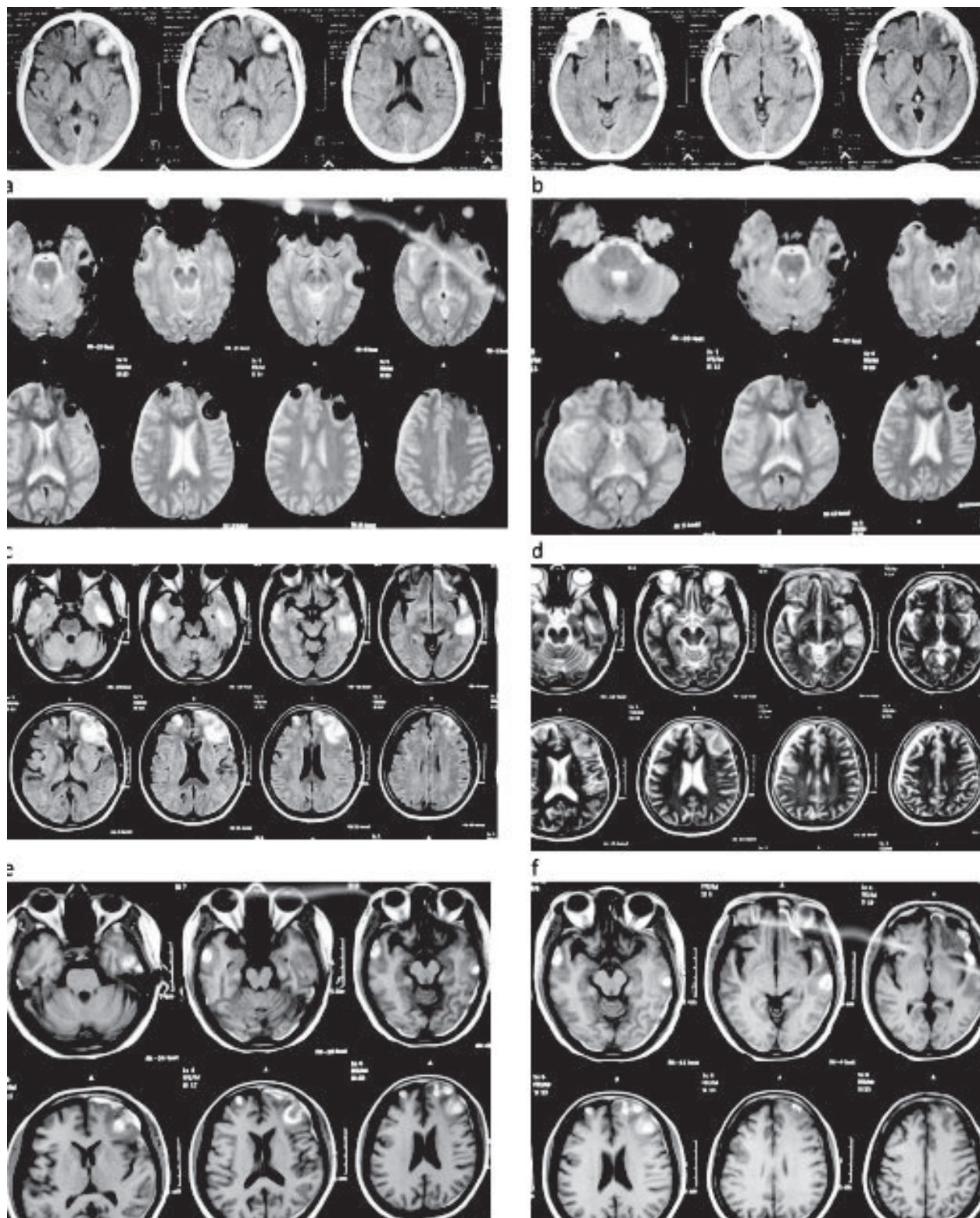


Fig.-1: Image of the brain of the patient. (a) Ct head hemorrhage in the right and left frontal lobe (b) CT head hemorrhage in the left temporal region (c,d) MIR of the brain, GRE sequence hypointense lesion in both frontotemporal region (e) FLAIR sequence hyperintense lesion in the both frontotemporal region (f) T2 sequence, hyperintense lesion in the right frontal lobe (g,h) T1 sequence hyperintense lesion in both frontotemporal region

Discussion:

In this case report, we reported a rare presentation of dengue fever as dengue hemorrhagic encephalitis. According to the Bangladesh guideline for the management of dengue fever, we considered the patient as expanded dengue fever.¹³ Our patient was a middle-aged female. She did not have any prior dengue infection. Her blood pressure and platelet counts were not the reason for her admission to the hospital. She got admitted due to her severe unremitting headache. We found signs of meningeal irritation at presentation. We considered aseptic meningitis for this relentless severe headache. Dengue is a rare cause of meningitis, and 4% of dengue may have meningitis.¹⁴ In our patient, she was tested positive for dengue NS1 antigen on her day 3rd day of fever. It is highly sensitive and specific for dengue infection at day-3 of fever. So, we considered dengue as the reason behind meningism. Her platelet count was 70000 and had the potential to go down. So, we did not go for CSF analysis. We decided to treat the patient conservatively. But the next day patient developed disorientation. We did tests to exclude the metabolic reason, which is the most common cause of disorientation in the case of dengue.¹⁷ But all the relevant investigation was within normal. So, to exclude possible encephalitis, we did an MRI of the brain. It showed multiple early subacute hemorrhages, mainly in the frontal and the temporal lobes. The platelet count was 700000 cells/mm and was increasing from the second day of admission, and the age of the hemorrhage was about 3-7 days¹⁸ radiologically. Thus, we speculate that the incident occurred at the initial stage of the fever and the low platelet is not behind the reason for hemorrhage as found in another study.¹⁹ So, we made the diagnosis of dengue hemorrhagic encephalitis in these instances. Although in most cases, dengue encephalitis presented with bilateral thalamic and basal ganglia signal changes.^{20,21} In our case, we found hemorrhage in both frontal and temporal regions, which are rare manifestations. It fulfills the diagnostic criteria of dengue encephalitis.²² The treatment is mainly symptomatic.¹³ In our case, we also

treated the patient conservatively. She was discharged with some disorientation after nine days of admission. At follow-up in 1 month, she completely recovered.

Conclusions:

Unusual headache, neck stiffness, and behavioral abnormality in dengue fever should alert the physicians for possible dengue encephalitis. As it mostly recovers spontaneously, it may go undetected.

References:

1. Aziz MA, Gorham JR, Gregg MB. "Dacca fever"-an outbreak of dengue. *Pak J Med Res.* 1967;6(2):83-92.
2. Rahman M, Rahman K, Siddique AK, et al. First outbreak of dengue hemorrhagic fever, Bangladesh. *Emerg Infect Dis.* 2002;8(7):738-740. doi:10.3201/eid0807.010398
3. Hossain MA, Khatun M, Arjumand F, Nisaluk A, Breiman RF. Serologic evidence of dengue infection before onset of epidemic, Bangladesh. *Emerg Infect Dis.* 2003;9(11):1411-4. Epub 2004/01/14. pmid:14718084; PubMed Central PMCID: PMC3035545.
4. Guzman MG, Kouri G. Dengue: an update. *Lancet Infect Dis* 2002; 2:33-42.
5. Pierson Theodore C, D MS. In: *Flaviviruses*. Fields Virology. P. M. H. David M Knipe, Vol. 1. Philadelphia, PA 19103 USA: Lippincott Williams & Wilkins, a Wolters Kluwer; 2013. p. 774-94.
6. Dengue outbreak in Bangladesh. From <https://www.outbreakobservatory.org/outbreakthursday-1/9/23/2021/dengue-outbreak-in-bangladesh>. Accessed 20 novembre 2021.
7. Mutsuddy P, Tahmina Jhora S, Shamsuzzaman AKM, Kaiser SMG, Khan MNA. Dengue Situation in Bangladesh: An Epidemiological Shift in terms of Morbidity and Mortality. *Can J Infect Dis Med Microbiol.* 2019 Mar 10;2019:3516284. doi: 10.1155/2019/3516284. PMID: 30962860; PMCID: PMC6431455.
8. Sanguanserm Sri, T., Poneprasert, B., and Phornphutkul, B. (1976). Acute Encephalopathy Associated with Dengue Infection. *Bangkok: SEAMEOTROPED*, 10-11.
9. 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
10. Carod Artal FJ, Wichmann O, Farrar J, Gascón J. Neurological complications of dengue virus infection. *Lancet Neurol* 2013; 12:906-19

11. S Rao, M Kumar, S Ghosh, AK Gadpayle. A rare case of dengue encephalitis. *BMJ Case Rep* (2013), 10.1136/bcr-2012-008229
12. M Puccioni-Sohler, M Orsini, CN Soares. Dengue: a new challenge for neurology. *Neurol Int*, 4 (3) (2012), p. e15
13. National guideline for clinical management of dengue syndrome 4th edition 2018.
14. Khanna A, Atam V, Gupta A. A case of dengue encephalitis with intracerebral hemorrhage. *J Glob Infect Dis* 2011; 3:20-7.
15. Jackson ST, Mullings A, Bennett F, Khan C, Gordon-Strachan G, Rhoden T (2008) Dengue infection in patients presenting with neurological manifestations in a dengue endemic population. *West Indian Med J* 57:373-376
16. Chatterji S, Allen JC Jr, Chow A, Leo YS, Ooi EE. Evaluation of the NS1 rapid test and the WHO dengue classification schemes for use as bedside diagnosis of acute dengue fever in adults. *Am J Trop Med Hyg*. 2011;84(2):224-228. doi:10.4269/ajtmh.2011.10-0316
17. Hendarto SK, Hadinegoro SR. Dengue encephalopathy. *Acta Paediatr Jpn*. 1992 Jun; 34(3):350-7. doi: 10.1111/j.1442-200x.1992.tb00971.x. PMID: 1509881.
18. Bradley WG Jr. MR appearance of hemorrhage in the brain. *Radiology*. 1993 Oct;189(1):15-26. doi: 10.1148/radiology.189.1.8372185. PMID: 8372185.
19. Khanna A, Atam V, Gupta A. A case of dengue encephalitis with intracerebral hemorrhage. *J Glob Infect Dis*. 2011;3(2):206-207. doi:10.4103/0974-777X.81707
20. Kamble R, Peruvamba JN, Kovoov J, Ravishankar S, Kolar BS. Bilateral thalamic involvement in dengue infection. *Neurol India* 2007; 55:418-9.
21. Acharya S, Shukla S, Thakre R, Kothari N, Mahajan SN. Dengue encephalitis A rare entity. *J Dent Med Sci* 2013; 5: 2.
22. Soares, C. N., and Marzia, P. S. (2014). Diagnosis criteria of dengue encephalitis. *Arq. Neuropsiquiatr*. 72:263. doi: 10.1590/0004-282X20130251.