

Concomitant Presentation of Dengue Hemorrhagic Fever with Guillain-Barré Syndrome (GBS)

JD NATH^a, M BHOWMIK^b, NH NAYEM^c, AAL MAMUN^d

Abstract:

Guillain- Barre syndrome (GBS) is one of the rare complications in Dengue. We report a uncommon presentation as simultaneous onset of Dengue Haemorrhagic fever (DHF) with GBS. 29 year old student presented with bilateral weakness of lower legs after 2 days onset of fever and he was admitted and treated as DHF, Later he was diagnosed as GBS on the

basis of areflexia and Nerve conduction study. He was recovered gradually and given only physiotherapy.

Key Words; GBS; Guillain- Barre syndrome , DF; Dengue fever, DHF; Dengue Hemorrhagic fever

(J Bangladesh Coll Phys Surg 2023; 41: 88-91)

DOI: <https://doi.org/10.3329/jbcps.v41i40.69721>

Introduction:

Dengue is a mosquito-borne, single positive-stranded ribonucleic acid (RNA) virus of the family Flaviviridae; genus Flavivirus. Dengue viruses are spread to people through the bite of an infected *Aedes* species (*Ae. aegypti* or *Ae. albopictus*) mosquito. These mosquitoes also spread Zika, chikungunya, and other viruses. Almost half of the world's population, about 4 billion people, live in areas with a risk of dengue. Dengue is often a leading cause of illness in areas with risk. Dengue outbreaks are occurring in many countries of the world in the Americas, Africa, the Middle East, Asia, and the Pacific Islands. Each year, up to 400 million people are infected by a dengue virus. Approximately 100 million people get infected from infection, and 40,000 die from severe dengue.¹ Presentation of dengue viral infection is variable, ranging from asymptomatic viral infection to

life threatening dengue shock syndrome and more unusual manifestations are being reported.

Dengue virus (DENV) has four serotypes (DENV-1, DENV-2, DENV-3, DENV-4). All four serotypes of the dengue virus have been reported in Bangladesh with the predominance of DENV 1 and DENV2 until 2016. Since 2019, when the largest dengue outbreak was reported, DENV3 has been the predominant serotype, while this year DENV2 has become the predominant serotype.

From 1 January to 7 August 2023, the Ministry of Health and Family Welfare of Bangladesh reported a total of 69 483 laboratory-confirmed dengue cases and 327 related deaths, with a case fatality rate (CFR) of 0.47%. Of these, 63% of cases and 62% of the deaths were reported in the month of July 2023². As of 28 September 2023, the Directorate General of Health Services (DGHS) has reported 199,188 hospitalizations and 967 deaths due to the *Aedes* mosquito-borne tropical disease in the 2023 outbreak year.³

The neurological manifestations of dengue can be divided into 3 categories:

1. Direct neurotropism- encephalitis, meningitis, myelitis and myositis;
2. Systemic complications-encephalopathy, stroke and hypokalemic paralysis;
3. Post-infectious/immune mediated- acute disseminated encephalomyelitis (ADEM), GBS and optic neuritis.⁴

- a. Dr. Jishu Deb Nath, Associate Professor Department of Medicine, Chattogram Maa –O- Shishu Hospital Medical College, Chattogram, Bangladesh.
- b. Dr. Mitu Bhowmik, Medical Officer, Department of Medicine, Chattogram Maa –O- Shishu Hospital Medical College, Chattogram, Bangladesh
- c. Dr. Nakibul Hasan Nayem, Medical Officer, Department of Medicine, Chattogram Maa –O- Shishu Hospital Medical College, Chattogram, Bangladesh
- d. Dr. Abdullah Al Mamun, Medical Officer, Department of Medicine, Chattogram Maa –O- Shishu Hospital Medical College, Chattogram, Bangladesh

Address of Correspondence: Dr. Jishu Deb Nath, Associate Professor Department of Medicine, Chattogram Maa –O- Shishu Hospital Medical College, Chattogram, Bangladesh. Mobile: 01716405056, jishudebnath2007@gmail.com

Received: 15 Oct., 2023

Accepted: 19 Oct., 2023

Case presentation:

29 years old male student with no previous co morbidities presented in the emergency room with the complaints of history of fever for 5 days, afebrile last 4 days and

weakness of both lower limbs for 7 days.

Fever was high grade continued initially and highest recorded was 104⁰ F associated with generalized bodyache. He had no history of cough ,sore throat or burning micturition neighter from onset of fever nor last two months .From 2nd day he felt paresthesia and numbness in both lower legs and felt weakness on both legs and gave history of fall while tried to go to washroom and got injured to right inner thigh on third day of fever. Weakness was gradually increasing on next day and he also felt weakness of both hands also and unable to walk without assistance. He denies any history of sore throat, loose motion and UTI previously within one month. His bowel and bladder habit is normal and does not give any breathing and swallowing difficulties. On 7th day of fever he noticed large ecchymosis area in right inner thigh.



Fig-1:

He was hospitalized in a private hospital in Chattogram on 5th day of fever and blood investigation revealed thrombocytopenia with a platelet level of 84x 10⁹/L and leukopenia with a white cell count of 4.3 x 10⁹/L. He had a normal hemoglobin level of 13.5 g/dL and a hematocrit level of 39.5% on day 5. Dengue NS1 antigen and dengue-IgM were positive. Liver enzymes were 3 fold raised. Platelet was progressively declined to 10x 10⁹/L on 7th day of fever. He was diagnosed as a case of DHF on the basis of clinical scenario with large ecchymosis and treated there with one unit of platelet transfusion in addition to all supportive measures. He belongs to a middle class family and denied any history of drug or substances abuse. He is unmarried but gave history of sexual exposure to his female partner 4 years back.

On day 7 patient was shifted to another tertiary hospital as he is worried about lower limb weakness. Here details history and examination were done and noted he is afebrile for 2 days, vitals is normal and large ecchymosis measuring about 20.3×14.6 cm in size . His abdomen was soft ,nontender , no organomegaly and ascities. Examination of Respiratory and CVS was unremarkable.

Neurological exam revealed GCS was normal, no meningeal irritation sign and intact cranial nerves. Muscle power 4/5 in lower limbs and normal in upper limbs and absent deep tendon reflexes in all four limbs.

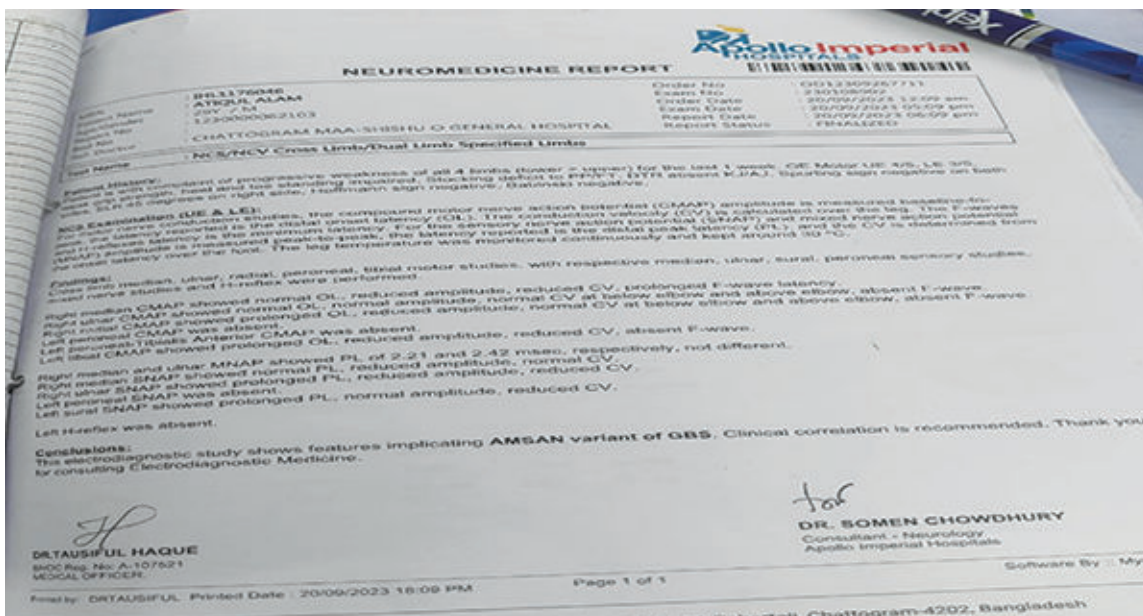


Fig-2:

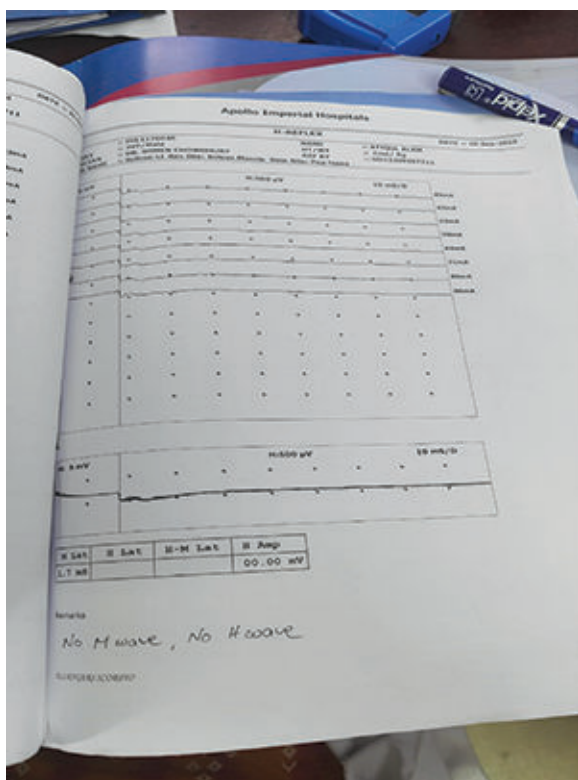


Fig-3:

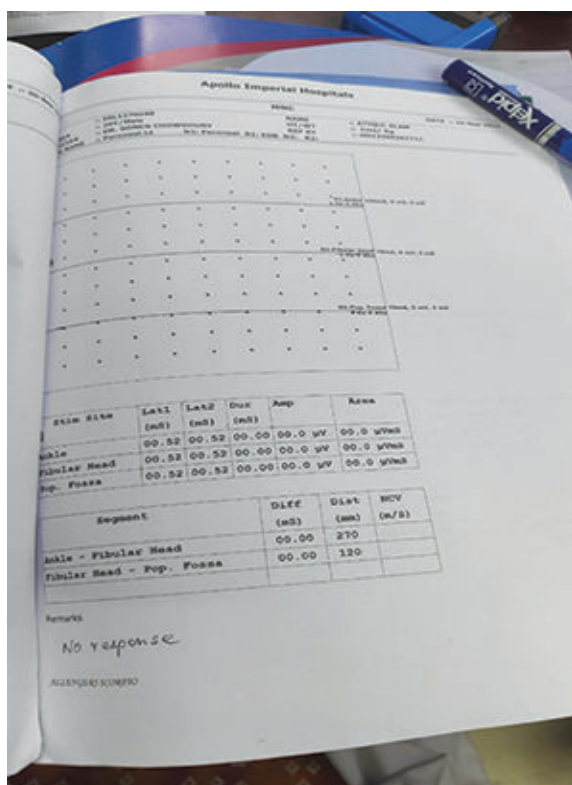


Fig-4:

Planter was flexor.

Repeat investigation showed platelet count 100, 129 thousands in day 9 and day 10. Electrolyte and thyroid function test is within normal range. Cerebrospinal fluid analysis showed 3 lymphocyte/mm³, protein 93 mg/dl, and sugar 66 mg/dl. NCV study shows reduced motor conduction velocity and Prolonged F-wave latencies are noted in

all the nerves tested in lower limbs. He was not given any specific therapy as he was recovering from dengue and GBS was in plateau phase but only given physiotherapy.

Discussion:

GBS is immune-mediated acute inflammatory polyneuropathy with a monophasic disease course. It has an incidence of 0.6–1.9 per 100,000 population and characterized by ascending paralysis, areflexia, and sensory changes. Most cases are preceded by a presumed triggering event, primarily infections. Several microbial pathogens have been identified as triggers, including *Campylobacter*

jejuni, Zika virus, and cytomegalovirus. It is the most common peripheral nervous system complication of dengue fever, and is usually reported during the recovery phase of the illness⁵

AMAN is a rare variant of GBS classified based on NCS. There are numerous case reports and case series on dengue with GBS.

Our patient presented with symmetrical lower limbs weakness on day three of fever (febrile phase) which is relatively uncommon, as most case studies reported the occurrence of GBS after one to two weeks from the onset of dengue illness. A case review of neurological manifestations of dengue infection by Guo et al. reported that the average time it takes for neurological signs of GBS to develop was one to 19 days after the onset of dengue.⁶ The development of GBS with evidence of abnormal electrophysiological findings in a proven case of the early phase of dengue suggests that these two diseases are unlikely to be coincidental. There was no respiratory involvement or further ascending paralysis in this patient.

GBS is thought to be caused by an aberrant immune response to infections those results in damage to peripheral nerves, although the pathogenesis is not fully understood. In a subgroup of patients with GBS, serum antibodies are found against gangliosides, which reside at high densities in the axolemma and other components of the peripheral nerves. Complement activation, infiltration of macrophages and oedema are typical characteristics of affected peripheral nerves and nerve roots in patients with GBS⁷.

There are a few previous reports that described GBS in patients with dengue particularly in adults. Gupta P et al.⁸ reported a case of post-dengue GBS in a 24-year old unmarried male. Similarly, Nee Kong Chew et al.⁹ reported two cases of post-dengue GBS.

In our patient, the presence of a positive dengue-specific IgM antibody test indicates acute dengue illness. Neurological manifestations, pattern of electrophysiological study and the typical CSF findings were consistent with the diagnosis of GBS. Thrombocytopenia at the time of presentation and skin manifestation of bleeding, which made us suspect dengue-associated GBS which was confirmed by positive dengue IgM test. Concomitant dengue and GBS were uncommon and DHF is the rare findings .

In a meta-analysis of six phase 2 trials comparing plasma exchange to supportive care alone in GBS found that patients treated with plasma exchange had significantly better outcome measures including time to recover walking without aid, percentage of patients requiring artificial ventilation, duration of ventilation, full muscle strength recovery after 1 year, and severe sequel after 1 year.¹⁰ Our patient is unfortunately missed GBS in first hospital and later diagnosed in second hospital and improved by conservative treatment.

Conclusion

Most of the published case reports showed GBS was associated with classical Dengue symptoms and occurred after recovery of Dengue but this case was associated with Dengue Haemorrhagic fever and occurred concomitantly with Dengue infection. Limb weakness should not be ignored in Dengue patients as chances of catastrophes. Probably our patient is luckily reached to plateau and finally recovered without definitive treatment of GBS.

Conflict of Interest Statement

We declare there is no conflict of interest with regard to the publication of this case report.

Funding Sources

There is no financial support in the publication of this case report.

Data Availability

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Acknowledgments

The authors would like to thank the patient for giving his consent and cooperation in relation to the writing of this case report. The author would also like to thank the BCPS authority for permission to publish this interesting case report.

References

1. Dengue. Centers for Disease Control and Prevention. August 15, 2023
2. WHO dengue bd. August 11, 2023
3. Dengue Press Release – 28/09/2023, Health Emergency Operation Centre and Control Room, MIS, Directorate General of Health Services, Mohakhali (Dhaka), 28 September 2023
4. Murthy JMK. Neurological complication of dengue infection. *Neurol India*. 2010;58:581–4.
5. Verma R, Sahu R, Holla V. Neurological manifestations of dengue infection: a review. *J Neurol Sci*. 2014;346:26–34.
6. Hughes RA, Hadden RD, Gregson NA, Smith KJ: Pathogenesis of Guillain-Barré syndrome. *J Neuroimmunol*. 1999, 100:74-97.
7. Yuki, N. Infectious origins of, and molecular mimicry in, Guillain-Barre and Fisher syndromes. *Lancet Infect. Dis*. **1**, 29–37 (2001)
8. Gupta P, Jain V, Chatterjee S, Agarwal AK. Acute inflammatory motor axonopathy associated with dengue fever. *JACM*. 2009;10(1):58–9.
9. Chew NK, Goh KJ, Omar S, Tan CT. Guillain–Barre syndrome with antecedent dengue infection: a report of two cases. *Neurol J Southeast Asia*. 1998;3:85–6.
10. . Hughes RA, Wijdicks EF, Barohn R, Benson E, Cornblath DR, Hahn AF, et al. Practice parameter: immunotherapy for Guillain-Barré syndrome: report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*. 2003;61:736–740.