BOHR International Journal of Neurology and Neuroscience
2025, Vol. 3, No. 1, pp. 21–24
DOI: 10.54646/bijnn.2025.26
www.bohrpub.com

CASE REPORT

Dengue fever with hypokalemic paralysis-a case report

Osama Alian, Saima Majid Mattoo*†, Devdutt Nayak and Anandi Damodaran

Emirates health services (EHS), Sharjah Kuwait Hospital, Sharjah, United Arab Emirates

***Correspondence:**
Saima Majid Mattoo,
saima2999@yahoo.com

†ORCID:
Saima Majid Mattoo,
0009-0009-5447-4053

Received: 30 April 2025; **Accepted:** 17 June 2025; **Published:** 03 August 2025

Dengue is the most significant mosquito-borne, arboviral infection that is prevalent in tropical and subtropical regions. The clinical presentation of dengue can range from resembling a typical flu to life-threatening dengue hemorrhagic fever. Brain-related issues of dengue are rare. Unfortunately, there has been a gradual increase in evidence regarding the neurotropism and complications associated with dengue virus over the past 10 years. Dengue virus infection can lead to various neurological complications, such as encephalitis, acute disseminated encephalomyelitis, transverse myelitis, and Guillain–Barré syndrome. There are only a few rare instances where hypokalemic acute pure motor quadriparesis has been reported in individuals with dengue fever. We describe a patient who experienced sudden weakness in all four limbs, which improved after treatment for low potassium levels, and required intensive care, intubation, and mechanical ventilation due to confirmed dengue fever. Medical professionals working in regions where dengue fever is prevalent should be knowledgeable about the potential complications of acute pure motor paralysis caused by low potassium levels. Dengue fever is a viral infection that can cause flaccid paralysis, a condition where the muscles become weak and floppy. One of the symptoms of dengue fever is hypokalemia, a low level of potassium in the blood. Another symptom is quadriparesis, paralysis of all four limbs.

Keywords: dengue, hypokalemia, paralysis, flaccid, fever, hemorrhagic fever, quadriparesis

Background

Dengue is the most significant mosquito-borne, arboviral infection prevalent in tropical and subtropical regions. A study published in 2021 estimates that dengue affects at least 400 million people each year worldwide and causes 22,000 deaths. (1)

Dengue is caused by infection with one of the four serotypes of dengue virus, which belongs to the flavivirus genus, characterized by single-stranded non-segmented RNA viruses. It is spread by mosquitoes belonging to the genus Aedes, which are found in various subtropical and tropical regions worldwide (Medscape).

Initial dengue infection may be asymptomatic (50–90%) (2), may result in a nonspecific febrile illness, or may produce the symptom complex of classic dengue fever (Medscape).

Only a small number of individuals who have already been infected with one dengue serotype can experience bleeding and leakage of blood vessels when infected with another serotype. This condition is known as severe dengue (reclassified in 2009 by the World Health Organization, previously referred to as dengue hemorrhagic fever and dengue shock syndrome) (3) (Medscape).

The clinical presentation of dengue can range from a severe flu-like illness to a potentially life-threatening dengue hemorrhagic fever (4). There are only a few rare instances and limited studies that have documented acute pure motor quadriparesis in dengue fever (5, 6).

We documented one confirmed case of dengue infection that resulted in acute pure motor reversible quadriparesis, requiring intubation and mechanical ventilation due to low potassium levels. Due to the limited number of reported

cases of this condition from different institutes around the world, increasing awareness among physicians will allow them to consider the possibility of hypokalemia in patients with dengue fever who exhibit weakness and to effectively manage the condition.

Case report

Our patient is a 32-year-old male without any prior medical conditions. He had a high fever and body pain for 3 days, and on the third day, he suddenly developed weakness in his legs and arms, which got worse over the next few hours. There is no evidence to suggest that bladder and bowel dysfunction, trauma, recent intense physical activity, or vaccination have contributed to the patient's symptoms. There had never been any previous incidents of similar attacks, and there is no known family history of similar incidents.

Upon entering the hospital, the patient had a fever of 38.5°C in their armpit. He was aware and physiologically sound. No Dermatological Lesion Strength in all five limbs was 2/5 with low reflexes. Planters were extensors. No abnormalities were detected in the cranial nerves and sensory examination. No abnormalities were detected during respiratory and cardiovascular examinations. Initial laboratory examination revealed Hb of 17.2 g; the hematocrit on the first day was 46, which progressively decreased to 35% on the third day with fluid replacement.

The total leukocytes count was 3,900/mm^3 mild leukopenia and lymphopenia, while the platelet count was initially 73,000/mm^3, dropped to 15,000 and then 9,000, started to improve on the 5th day, and normalized before discharge. The potassium level on admission was 1.4. Another monotonous experiment. Assessments revealed elevated liver enzymes (transaminitis), cardiac enzymes (myocarditis), increased CK, and myoglobin (myositis).

The levels of inflammatory markers, such as C reactive protein (CRP) and procalcitonin, were slightly elevated, indicating a possible viral infection. The doctors suspected dengue fever with thrombocytopenia and acute hypokalemic flaccid paralysis after the patient's symptoms. The patient's condition rapidly worsened, resulting in respiratory failure that required intubation and ventilation, ultimately leading to their transfer to the intensive care unit (ICU). The patient received an intravenous infusion of potassium chloride, and their potassium levels were adjusted on the first day.

Dengue serology results revealed positivity of dengue virus polymerase chain reaction (PCR) and immunoglobulin G (IgG). The blood smear did not show any signs of a malarial parasite, and tests for Leptospira IgM and IgG came back negative. Ultrasound examination showed no significant accumulation of fluid in the lungs or pelvis. The nerve conduction test was performed to rule out Guillain-Barré (GB) syndrome and revealed normal results (**Figures 1** and **2a, b**). The cerebrospinal fluid (CSF) examination and magnetic resonance imaging (MRI) of the brain and spine were conducted, and the results were normal.

The patient was successfully removed from the ventilator on day five without any complications and regained normal muscle strength. He was examined for any bleeding susceptibility. The repeated platelet counts and hematocrit monitoring did not indicate any decline, and the platelet count returned to normal by the fifth day. The patient was released from the hospital after making a complete recovery, with no signs of recurrence during the follow-up period.

Discussion

Dengue was considered a non-neurotropic virus. However, there has been a rise in the occurrence of neurotropism, or neuroinvasion of dengue virus infection (5, 7). In recent years, there have been numerous instances of dengue-related paralysis and various neurological complications linked to dengue fever, particularly in areas where the disease is endemic (5). The clinical picture was like GB syndrome, but the presence of fever at the time of weakness, the absence of albumin cytological dissociation, a normal nerve conduction study, and improvement of muscle power with potassium supplements excluded the possibility of GB syndrome (5).

The likelihood of familial periodic paralysis was low, as this was the individual's first episode of muscle weakness, and there was no family history of episodic motor weakness.

Myasthenia gravis may have been considered if a patient presented with features of extraocular weakness, bulbar palsy, and distal limb weakness mostly involving the upper limbs rather than the lower limbs. Our patient had predominantly lower limb weakness. In addition, the nerve conduction test will show a decremental response to repetitive stimulation. Here, the nerve conduction test was normal (8).

Botulism also forms an important differential diagnosis in a patient who presents with flaccid paralysis. However, botulism presents with initial cranial nerve involvement, followed by limb and diaphragmatic paralysis needing intubation. Our patient did not have cranial nerve involvement at any time. History did not suggest injury or intake of food that could be contaminated with botulinum toxin. Nerve conduction test shows a decreased motor evoked potential (9).

The neurological symptoms that arise from dengue infection are caused by a combination of immune-mediated damage, the neurotropic effects of the virus, and the systemic impact of the infection (10).

Jha and Ansari reported three confirmed cases of dengue infection leading to acute reversible hypokalemic pure motor paralysis (11). Two additional cases of hypokalemic reversible paralysis were reported due to upper respiratory tract infections caused by viruses (12). They noticed a significant improvement in symptoms after taking potassium

Nerve Conduction Studies
Ortho Sensory Summary Table

Stim Site	Onset (ms)	Peak (ms)	P-T Amp (ÂµV)	Site1	Site2	Dist (cm)	Vel (m/s)
Left Median Ortho Sensory (Wrist)							
2 nd dig	2.9	3.3	21.7	2 nd dig	Wrist	14.0	48
Left Sural Ortho Sensory (med mal)							
Calf	2.2	3.0	12.3				
Left Ulnar Ortho Sensory (Wrist)							
5 th Dig	2.8	3.2	25.9	5 th Dig	Wrist	14.0	50

Motor Summary Table

Stim Site	Onset (ms)	O-P Amp (mV)	Full Dur (ms)	Site1	Site2	Dist (cm)	Vel (m/s)
Right Ant. Tibial Motor (EDB)							
Ankle	4.4	2.5	12.97	B Fib	Ankle	33.0	45
B Fib	11.8	1.7	13.59				
Left Median Motor (APB)							
Wrist	3.7	12.7	28.36	Elbow	Wrist	25.0	54
Elbow	8.3	9.9	32.81				
Right Peroneal Motor (TA)							
Fib Head	3.9	7.3	36.48				

Nerve Conduction Studies
Ortho Sensory Left/Right Comparison

Stim Site	L Lat (ms)	R Lat (ms)	L-R Lat (ms)	L Amp (ÂµV)	R Amp (ÂµV)	L-R Amp (%)	Site1	Site2	L Vel (m/s)	R Vel (m/s)	L-R Vel (m/s)
Median Ortho Sensory (Wrist)											
2 nd dig	2.9			21.7			2 nd dig	Wrist	48		
Sural Ortho Sensory (med mal)											
Calf	2.3			12.3							
Ulnar Ortho Sensory (Wrist)											
5 th Dig	2.8			25.9			5 th Dig	Wrist	50		

Motor Left/Right Comparison

Stim Site	L Lat (ms)	R Lat (ms)	L-R Lat (ms)	L Amp (mV)	R Amp (mV)	L-R Amp (%)	Site1	Site2	L Vel (m/s)	R Vel (m/s)	L-R Vel (m/s)
Ant. Tibial Motor (EDB)											
Ankle		4.4			2.5		B Fib	Ankle		45	
B Fib		11.8			1.7						
Median Motor (APB)											
Wrist	3.7			12.7			Elbow	Wrist	54		
Elbow	8.3			9.9							
Peroneal Motor (TA)											
Fib Head		3.9			7.3						

FIGURE 1 | Nerve conduction test report.

supplements and correcting the low potassium levels, as reported by Santos et al. (6).

The potential cause of low potassium levels in these patients could be either the redistribution of potassium within the body or temporary kidney problems that result in increased potassium loss through urine. No indications of renal tubular dysfunctions were found during the initial studies. Nevertheless, transient self-limiting renal tubular defects caused by infections cannot be completely excluded. Due to the stress caused by the infection and the subsequent increase in catecholamine levels, there is a shift of potassium into the cells, leading to hypokalemia (2).

The case report suggests that more research and documentation are needed to understand the connection between acute pure motor weakness and viral infections like dengue. Healthcare professionals should be mindful of this connection, particularly in regions where the disease is prevalent, and take into account the possibility of hypokalemic paralysis when assessing patients with fever and sudden weakness in all four limbs.

Conclusion

Dengue fever can cause different brain problems. So hypokalemic paralysis with or without affection of respiratory muscle which may need mechanical ventilation secondary to dengue fever should be considered as a differential diagnosis in a case of acute febrile illness with muscle weakness in tropical or subtropical endemic countries especially during rainy season. This case report aims to raise awareness among healthcare professionals about a condition that can be effectively treated.

Study limitations

None in particular.

Data availability statement

Data is not available online due to legal and ethical grounds.

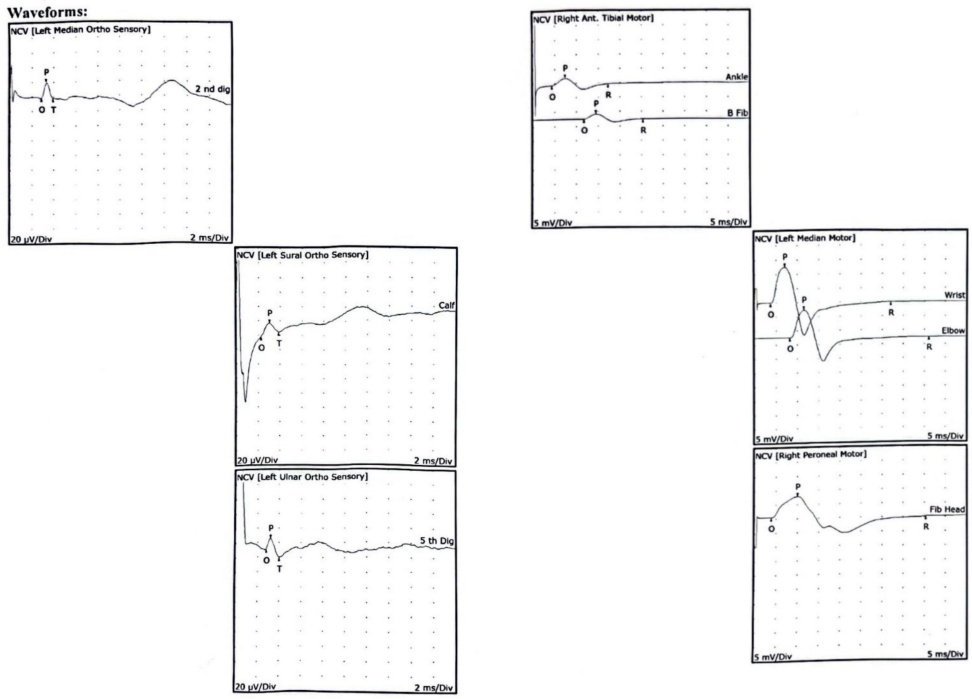

FIGURE 2 | Nerve conduction test tracings.

Ethical statement

As this is a case report -ethical committee approval is not required.

Author contributions

OA: Designed the case study, Conceptual development. SM: Data acquisition, analysis and editing. AD: Data acquisition and analysis. DNK: Conceptual development. All authors are responsible for the contents and integrity of this manuscript.

Financial disclosure

The authors do not have any sponsorship or commercial association funding for publishing the manuscript.

Consent for publication

Patient written informed consent has been taken to use his images and relevant information for publication.

Acknowledgments

None.

References

1. Roy SK, Bhattacharjee S. Dengue virus: epidemiology, biology, and disease aetiology. *Can J Microbiol* (2021) 67:687–702. doi: 10.1139/cjm-2020-0572
2. Gutch M, Agarwal A, Amar A. Hypokalemic quadriparesis: an unusual manifestation of dengue fever. *J Nat Sci Biol Med* (2012) 3:81–3.
3. Pancharoen C, Thisyakorn U. Neurological manifestations in dengue patients. *Southeast Asian J Trop Med Public Health* (2001) 32:341–5.
4. [Guideline] CDC. *Clinical Features of Dengue*. Centers for Disease Control and Prevention (2024). Available at https://www.cdc.gov/dengue/hcp/clinical-signs; Accessed March 2, 2025.
5. Kalita J, Misra UK, Mahadevan A, Shankar SK. Acute pure motor quadriplegia: is it dengue myositis? *Electromyogr Clin Neurophysiol* (2005) 45:357–61.
6. Santos NQ, Azoubel AC, Lopes AA, Costa G, Bacellar A. Guillain Barré syndrome in the course of dengue: case report. *Arq Neuropsiquiatr* (2004) 62:144–6.
7. Widodo D, Setiawan B, Chen K, Nainggolan L, Santoso WD. The prevalence of hypokalemia in hospitalized patients with infectious diseases problem at Cipto Mangunkusumo Hospital. *Jakarta. Acta Med Indones* (2006) 38:202–5.
8. Beloor Suresh A, Asuncion RMD. Myasthenia gravis. *StatPearls*. Treasure Island (FL): StatPearls Publishing (2025). Available from: https://www.ncbi.nlm.nih.gov/sites/books/NBK559331/
9. Rao AK, Sobel J, Chatham-Stephens K, Luquez C. Clinical guidelines for diagnosis and treatment of botulism, 2021. *MMWR Recomm Rep* (2021) 70:1–30. doi: 10.15585/mmwr.rr7002a1
10. Kok BH, Lim HT, Lim CP, Lai NS, Leow CY, Leow CH. Dengue virus infection - a review of pathogenesis, vaccines, diagnosis and therapy. *Virus Res* (2023) 324:199018.
11. Jha S, Ansari MK. Dengue infection causing acute hypokalemic quadriparesis. *Neurol India* (2010) 58:592–4.
12. Gupta M, Lehl SS, Singh R, Sachdev A. Hypokalemic periodic paralysis;2 novel causes. *Internet J Neurol* (2009) 12:1.