

Unusual presentation of more common disease/injury

Acute hypokalaemic quadriparesis in dengue fever

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Summary

The authors report acute hypokalaemic quadriparesis in two young patients that occurred during dengue epidemic in 2010 in India. Both patients developed flexic type of pure motor weakness in all four limbs without bladder bowel involvement, following 2 to 3 days of fever and malaise. Higher mental functions were normal. Serum potassium level was very low; 2–2.5 mmol/l. Non-structural protein (NS₁)-antigen and immunoglobulin M-antibody for dengue were positive in both patients. Both patients improved with potassium supplementation. In follow-up, they are doing well.

BACKGROUND

Acute hypokalaemic quadriparesis is an uncommon presentation of dengue fever, not yet widely recognised. Only few cases are reported from different institutes world wide. Awareness of this condition will enable physicians to keep a possibility of hypokalaemia in patients of dengue fever presenting with paresis and to manage specifically and effectively.

CASE PRESENTATION

Case 1

A 29-year-old male was hospitalised with complaints of high grade fever and malaise for 2 days and paralysis of all four limbs for 1 day. He was taking paracetamol for fever. History of any other drug intake could not be elicited. He was unmarried, non-vegetarian and had no addiction. He was febrile (39.4°C), ill looking but conscious and has no icterus, rash, generalized oedema and lymphadenopathy. Vitals were normal. Neurological examination revealed normal cranial nerves. He had power of grade 2/5 in all four limbs with inability to hold his neck. There was a generalised hyporeflexia and hypotonia. Plantar were bilateral non-elicitable. There were no sensory, bladder or bowel involvement. Family history was insignificant.

Case 2

A 24-year-old male was hospitalised with complaints of mild fever, headache and body ache for 2 days and acute onset weakness of all limbs for 1 day. He took paracetamol for fever. He was not married, a non-vegetarian and had no addictions. His vitals were stable and general examination revealed motor power 3/5 in all limbs. Deep-tendon reflexes were diminished and planter was non-elicitable, examination of sensory system and cranial nerve was normal.

INVESTIGATIONS

Case 1

serum potassium: 2.0 mmol/l, serum sodium: 138 mmol/l, serum calcium(ionic): 5.07 mg/dl, serum magnesium: 2.1 mg/dl, serum creatine kinase: 165 U/l. Non-structural

protein (NS₁) antigen and immunoglobulin M (IgM)-dengue positive, haemoglobin: 14.7 gm%, haematocrit: 43.2, platelet count: 1.3 lakhs/mm³. Urine potassium level: 32 mmol/day. Liver, renal and thyroid profiles were normal.

Case 2

serum potassium: 2.3 mmol/l, serum sodium: 138 mmol/l, serum calcium(ionic): 4.17 mg/dl, serum magnesium: 2.2 mg/dl, serum creatine kinase: 172 U/l NS₁ antigen and IgM dengue positive, haemoglobin: 14.0 g/dl%, haematocrit: 42.0, platelet count 67 000/mm³. Urine potassium level: 50 mmol/day. Liver, renal and thyroid profiles were normal.

DIFFERENTIAL DIAGNOSIS

- ▶ Acute flaccid quadriparesis in early phase of myelitis
- ▶ Channelopathies
- ▶ Acute Guillain-Barré syndrome (GB) syndrome
- ▶ Compressive myelopathy in spinal shock.

TREATMENT

Case 1

Intravenous-potassium chloride infusion was given. By day 2, the power in all four limbs improved. His serum potassium improved to 5.3 mg/dl at day 4. He was discharged with advice to take potassium rich diet.

Case 2

Patient was managed conservatively with potassium supplements orally. Patient started recovering within 12 h of treatment and discharged after 3 days.

OUTCOME AND FOLLOW-UP

Both patients improved and were discharged with advice to take potassium rich diet. In follow-up after 1 week, both patients were asymptomatic and are doing well.

DISCUSSION

Neurological manifestations of dengue fever include encephalitis, encephalopathy, aseptic meningitis, mononeuropathies, polyneuropathies, GB syndrome, myelitis,

intracranial haemorrhage and thrombosis. The pathology of neurological manifestation is multiple and includes neurotropic effect of dengue virus, systemic effect of dengue infection and immune-mediated injury.¹ Jha and Ansari² reported three confirmed cases of dengue infection causing acute reversible-hypokalaemic pure motor quadriplegia. Gupta *et al*³ reported two confirmed cases of hypokalaemic periodic paralysis precipitated by upper respiratory tract infection of viral aetiology. They also observed that potassium supplementation resulted in rapid improvement of symptoms. Santos *et al*⁴ reported GB syndrome in the course of dengue. The clinical profile of dengue is changing, and the neurological manifestations are reported more frequently. Widodo *et al*⁵ observed prevalence of hypokalaemia in 23% (n=105) of the hospitalised patients with infectious disease and Kalita *et al* studied 16 patients with dengue fever with quadriplegia, in seven, the pure motor quadriplegia was due to myositis.⁶ Hypokalaemia in association with infectious diseases, particularly in dengue fever, has been reported. Hypokalaemic paralysis secondary to chikungunya fever has also been documented.⁷ The putative mechanism of the hypokalaemia in our patients could be either due to redistribution of potassium in cells or transient renal tubular abnormalities, leading to increased urinary potassium wasting. Preliminary investigations were not suggestive of renal tubular abnormality. However, transient self limiting renal tubular defects secondary to infection could not be ruled out. Stress induced surge of catecholamine and insulin may result in intracellular shift of potassium and hypokalaemia.

Learning points

- ▶ Hypokalaemic quadriplegia is an unusual presentation of dengue.
- ▶ Short duration of fever precedes the symptoms of quadriplegia.
- ▶ Quadriplegia improved rapidly after the supplementation of potassium.
- ▶ Bony pain typical of dengue fever was not present.

Competing interests None.

Patient consent Obtained.

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