CASE REPORT

Acute Dengue Myositis in a Pediatric Patient—An Uncommon Complication of a Common Disease: A Case Report

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Abstract

Dengue fever is an arboviral disease caused by the dengue virus transmitted by the bite of female *Aedes aegypti* mosquitoes, affecting people worldwide often causing pandemics in Southeast Asian countries. Dengue viral infection symptoms range from flu-like illness to complications like pneumonia, and hepatitis, neurologic symptoms like encephalitis, myopathy, Guillain–Barre syndrome, phrenic neuropathy, subdural hematoma, and cerebral vasculitis. The possibility of skeletal muscle invasion causing myositis is another rare entity. We are reporting a case of dengue, with myositis presenting as muscle weakness, decreased power, and raised creatinine phosphokinase (CPK) level in a 6-year-old boy.

The boy suffered from dengue viral fever diagnosed by positive NS1 antigen. Initially, the symptoms were like uncomplicated dengue fever but later he developed leg muscle pain, and decreased range of movements. The serum CPK level was increased and then the boy was diagnosed with myositis. Later with supportive treatment, he improved, the pain subsided, the power and tone of his leg muscles increased and the serum CPK level returned to normal.

Keywords: Case report, Creatinine phosphokinase, Dengue, Myositis.

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Introduction

Dengue fever is an arthropod-borne viral infection caused by dengue virus (DENV) belonging to the genus *Flavivirus*. Dengue virus has four closely related serotypes (DENV1, DENV2, DENV3, and DENV4) transmitted by the bite of female *Aedes aegypti* mosquitoes.[1]

The global health disease burden of dengue has been found to be the highest among all the arboviral diseases with 100–400 million symptomatic infection over 125 countries with an estimated death of 10,000 deaths per year.[2] South East Asian countries have been showing an increasing trend in disease burden reporting the majority of cases along with countries in America and the Western Pacific Region, attributed to factors like increased urbanization, increased human movement, and favorable climate.[1,3]

Dengue fever symptoms range from biphasic fever with rash to hemorrhagic manifestations and shock syndrome in severe cases. Clinical manifestations depend on the host immune status, viral strain, primary or secondary infection, etc. Although myalgia is a common feature in dengue fever, myositis is a rare complication of dengue fever. Here we report a case of dengue myositis and raised creatinine phosphokinase (CPK) in a patient of the pediatric age group.

Case Description

A 6-year-old boy presented to the Out Patient Department of the College of Medicine and Sagore Dutta Hospital with a history of acute onset high-grade fever, biphasic in nature, associated with rash and myalgia for 3 days. His temperature chart showed variations ranging from 102 to 104° F during fever episodes which was relieved by antipyretics. He developed severe pain in bilateral thigh and calf muscles, acute in onset, non-radiating, and the patient was unable to walk at the time of presentation. The patient also had complaints of severe abdominal pain and vomiting since the onset of the fever.

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On examination the patient was febrile, and blood pressure was maintained with good pulse volume. His pulse rate was 120/minute. A general examination showed facial flushing and rashes. The chest was clear with normal breath sounds bilateral. Cardiovascular system examination was also within normal limits. However, abdominal examinations revealed just palpable liver. Neuromuscular examination revealed normal higher mental functions and no sensory impairment. However, the child had slightly swollen tender calf muscles, with decreased power of grade IV/V.

Chest X-ray was within normal limits, however, ultrasonography whole abdomen revealed an edematous gall bladder. Investigations are mentioned in Tables 1 and 2.

Table 1: Pathological investigations

Parameter	*Day*	*Value*	*Biological reference interval*
Dengue NS1	3	Reactive (>7.27)	Reactive: ≥1.0 Equivocal: 0.5–<1.0 Non-reactive: <0.5
Malaria vivax	3	Negative	Not applicable
Malaria falciparum	3	Negative	
Creatinine phosphokinase	3	1898 U/mL	46–171 U/mL
	10	170 U/mL	
CRP	3	<0.4 mg/dL	<1 mg/dL
SGPT	6	243 U/L	7–55 U/L
	8	161 U/L	
	10	67 U/L	

Table 2: Hematological investigations

Parameter	*Day*	*Value*	*Biological reference interval*
Hemoglobin	3	12.5 gm/dL	11.5–15.5
	6	12.9 gm/dL	
	8	13.2 gm/dL	
	10	13.9 gm/dL	
Hematocrit/PCV	3	37.2%	34–40%
	6	38.8%	
	8	39.3%	
	10	38.8%	
RBC	3	4.61×10^6/µL	4.0–5.2
	6	4.8×10^6/µL	
	8	4.79×10^6/µL	
	10	4.87×10^6/µL	
WBC	3	5.6×10^3/µL	5–13
	6	6.0×10^3/µL	
	8	9.1×10^3/µL	
	10	5.1×10^3/µL	
Platelet	3	185×10^3/µL	$170–450 \times 10^3$
	6	178×10^3/µL	
	8	241×10^3/µL	
	10	399×10^3/µL	
Differential leucocyte count	3	N-56% L-39% M-5%	N-40–60%
	6	N-53% L-40% M-5%	L-20–40%
	8	N-36% L-55% M-7%	M-2–5%
	10	N-36% L-54% M-8%	E-1–4%
			B-0–0.9%

Treatment and Follow-up

The child's condition was self-limiting and hence he was treated as per standard dengue national management guidelines with antipyretics and regular monitoring of blood pressure, hematocrit, platelet count, and level of consciousness. The child became afebrile since the 5th day and the pain in calf muscles gradually decreased, and the power returned back to 5/5 on day 8 and all limb movements became normal with treatment. Serum CPK levels also improved from 1898 to 170 U/mL over 7 days.

Discussion

Dengue fever has a broad spectrum of presentation ranging from asymptomatic infection to moderate febrile illness to severe disease with multi-organ failure in some cases. The common manifestations include nausea, vomiting, rash, myalgias, arthralgias, retro-orbital pain, headache leukopenia, and thrombocytopenia. Neuromuscular complications like mono-neuropathies, polyneuropathies, encephalitis, Guillain–Barre syndrome, and myositis though rare, have been documented kinds of literatures. Myositis can lead to rhabdomyolysis, myoglobinuria, and acute renal failure which may lead to multi-organ failure and death if left unattended. The mechanism of muscle involvement in dengue fever is largely unknown but it has been postulated that dengue virus increases the production of inflammatory cytokines like tumor necrosis factor (TNF), myositis is caused largely because of such inflammatory cytokines like TNF and interferon alpha and not due to direct muscle invasion by dengue virus. Acute myositis is caused by viruses like HIV-1 and HTLV-1. Though not routinely done yet, muscle biopsy may show inflammatory infiltrates and foci of myonecrosis in dengue myositis similar to the histological appearance of other viruses that cause similar symptoms.

Literature has shown that the neurological complications in dengue are principally observed as two distinct patterns. In the study done by Mishra UK, and Kalita J in 2006, the presentation was first presented with mild symptoms, followed by myalgia and finally, it ended up in severe complications such as encephalopathy, pure motor weakness, and severe myositis.[4] Another published literature with a compilation of 34 studies of dengue-related myositis reported that dengue-associated myositis is common in the younger age groups (mean: 24.6 years) with a male predominance. The onset of weakness varied from 3 days to 36 days (mean: 9.4 days). Muscle weakness is frequently accompanied by muscular pain. Serum CPK has been found to have markedly raised (mean: 10,558 IU/L; range: 162–117,200 IU/L). Though the condition was mostly self-limiting (mean: 7 days) the persistent ones were found to respond to corticosteroid administration.[5]

Another study of dengue myositis done by J Finsterer on a 38-year-old male patient, diagnosed case of dengue by Ns1 and IgM, developed severe arthralgia, shoulder pain, pelvic girdle pain and decreased range of movement with leukopenia, thrombocytopenia, elevated CPK level, normal CKMB, elevated levels of liver transaminases. The patient developed high fever, and chills and rigor again after 5 days of subsidence of the initial fever with swelling around the shoulder. Pain did not subside completely with NSAIDS and he required corticosteroids for 20 days for complete recovery of myositis.[6] So, in this case, the myositis was persistent, and overt and required long-term treatment and repeated follow-up.

Conclusion

Dengue myositis ranges from mild muscle pain, warmth, and swelling to severe tenderness, rhabdomyolysis, and even permanent disability like acute flaccid paralysis especially in the pediatric population. Though most cases are self-limiting, this

often may progress to serious complications like acute kidney injury and multiorgan failure which can be prevented by early diagnosis and adequate conservative treatment. Hence, all dengue patients with features of muscle tenderness and weakness should establish the diagnosis by CPK assessment and also undergo urinalysis, and those who test positive for blood should undergo urine microscopy along with CPK to diagnose rhabdomyolysis which may often prove lifesaving.

Limitation of Study

Dengue IgM, which is a confirmatory for diagnosis of dengue had to be done but due to money constraints and temporary unavailability of kits for IgM, we could not do the test. The baby was already diagnosed with positive NS1 antigen just after the appearance of the signs and symptoms. All signs and symptoms and other supportive investigations were also pointed to the diagnosis of dengue. Still, being a confirmatory test of dengue, IgM should have been done. Due to limited resources and the poor socio-economic condition of the parents of the baby, we also could not perform the tests for the other causes of viral fever like rickettsial fever, chikungunya, enteric fever, etc.

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