

Review Article

Dengue Myositis and Review of Literature

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Abstract

Dengue is an acute mosquito-borne infection caused by dengue viruses from the genus flavivirus. Although viral myositis is common, myositis caused by dengue virus is not commonly reported. We present a case of an 18 year old female with serologically confirmed dengue fever presenting with severe myalgia and lower limb weakness. Twenty fold elevation of serum creatinine kinase level was noted. She was conservatively managed and made an uneventful recovery. Myositis with dengue virus may be under-recognized and under reported. We suggest that patients with dengue fever presenting with severe myalgia should have serum creatinine kinase levels checked and urinalysis for myoglobinuria for early detection and prevention of rhabdomyolysis.

Key words: Dengue; Virus; Myositis; Rhabdomyolysis

Introduction

Dengue fever is a viral disease caused by Dengue viruses. With the recent epidemic of dengue fever there have been increases in reported cases of unusual manifestation of dengue fever. Most of these manifestations of dengue fever are underreported, under recognized or not casually linked to dengue fever. Musculoskeletal manifestations of dengue fever include polyarthrititis, rhabdomyolysis and myositis with elevated CPK. Although in medical literature myositis following dengue illness is rare, we believe that many patients with dengue illness present with myalgia and the presence of myositis may not have being biochemically detected and may be under reported. Patients with dengue illness with myalgia should have serum creatinine kinase levels measured and urinalysis done for hemagglutination for early diagnosis of myositis which might be complicated with rhabdomyolysis and acute renal failure. If myositis and rhabdomyolysis detected early, potential complications can be prevented.

Case presentation

Previously apparently healthy 18 year old female from Kandy presented with a history of high grade fever for five days duration

intermittently associated with chills without and diurnal variation and it was not associated with bleeding, rash or arthralgias. Fever was associated with severe myalgia, mainly localized to lower limbs. Myalgia was gradually progressing and patient was unable to walk due to severe pain on the day of admission. She did not have any urinary or bowel symptoms, no respiratory distress or neurological symptoms

On examination she was conscious, rational and febrile with a pulse rate of 84 beats per minute and blood pressure of 110/70 mmHg with no postural drop. Her cardiovascular and respiratory examination was unremarkable. Right hyperchondrium was tender with no organomegaly or free fluid. Neurological examination revealed weakness of bilateral lower limbs with a power 4/5. Bilateral ankle jerks were diminished and active and passive stretching of the muscles was associated with marked tenderness without any swelling. There were no muscle fasciculations.

Diagnosis of dengue fever was confirmed with positive NS1 antigen and positive dengue Ig M. Investigations showed leucopenia (Total leukocyte count $1.8/\text{mm}^3$) and thrombocytopenia ($119/\text{mm}^3$) on the day of admission. Creatinine kinase was markedly elevated with an absolute value of 3754u/L. Liver transaminases showed tenfold rise on admission (AST 421 ALT 230). Urine examination was normal with no myoglobinuria. Renal function tests, serum electrolytes and other routine biochemistry were normal. She was managed conservatively with fluids and analgesics and became clinically improved and afebrile.

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Her leucopenia and thrombocytopenia reverted, transaminases normalized and creatinine kinase reduced to 360u/L over next 4 days and was discharged.

Discussion

Dengue fever is a viral disease caused by Dengue viruses. It is a mosquito-borne single positive-stranded RNA virus of the family *Flaviviridae*; genus *Flavivirus*. *Flavivirus* is a genus of viruses in the family *Flaviviridae*. This genus includes the West Nile virus, dengue virus, tick-borne encephalitis virus, yellow fever virus, Zika virus and several other viruses.

With the recent epidemic of dengue fever there have been increases in reported cases of unusual manifestation of dengue fever. Most of these manifestations of dengue fever are underreported, under recognized or not casually linked to dengue fever. Musculoskeletal manifestations of dengue fever include polyarthritis, rhabdomyolysis and myositis with elevated CPK [1].

Acute severe myositis following viral infections is well described for some viruses such as HIV-1, human T lymphotropic virus 1 (HTLV-1), influenza, coxsackieviruses, and echoviruses. Myositis can be complicated with rhabdomyolysis, myoglobinuria and acute renal failure and may lead to multi organ dysfunction and death.

We describe dengue virus as a rare but potential cause for acute myositis. Similar to viruses well known to cause myositis, dengue is associated with a viraemic phase with prostration and myalgia. Myositis due to dengue virus can be mainly due to production of various inflammatory cytokines such as TNF and interferon alpha as direct invasion of muscle by virus has not being consistently demonstrated [2-3]. Dengue virus is shown to increase TNF in humans. Muscle biopsies done in dengue patients show inflammatory infiltrates and foci of myonecrosis which is similar to histological appearance of other viruses that cause severe myositis. A series of muscle biopsies obtained from 15 patients with dengue fever in Brazil reported mild inflammatory mononuclear infiltrates and foci of myonecrosis in 3 patients [4].

Myositis following dengue fever leading to rhabdomyolysis is rare but reported in literature. A case report coming from India reported a 40 year old male presented with fever and myalgia which was serologically confirmed to have dengue fever developing acute flaccid hyporeflexic motor quadriparesis leading to respiratory failure followed by dark urine and oliguria. Urine myoglobin was positive, CPK was more than 20000, EMG confirmed myopathic changes and muscle biopsy confirmed myositis and myonecrosis [5]. A case report describes 2 patients who developed rhabdomyolysis due to dengue virus infection. The first patient recovered with no sequelae, but the second developed multiple organ failure and died [6]. Few case reports of patients with dengue fever causing myoglobinuric renal failure are reported with fatalities and studies emphasized that urinalysis should be performed for all patients with severe dengue virus infection as a screening tool for rhabdomyolysis and

followed up by CPK levels for early detection and prevention of myoglobinuric renal failure [7].

Patients with dengue fever can present with pure motor weakness. It is short lived and prolonged. Myalgia after resolution of dengue fever also reported. One case report from Austria reports a patient with dengue fever with myositis presenting with severe myalgia which is lasting for several weeks after recovery from the dengue illness which did not respond to non steroidal anti-inflammatory drugs, but promptly responded to steroids. [8]

Dengue virus may result in acute pure motor quadriparesis due to myositis. One study reports 16 patients of dengue fever presenting with quadriplegia. Elevated CPK and transaminases were noted in all patients. So in endemic areas dengue fever should be considered in the differential diagnosis of acute flaccid paralysis [9].

One study done in India reports 7 cases of dengue fever with myositis in which 3 suffered fulminant myositis with generalized weakness which included respiratory muscles and 2 of them needed mechanical ventilation and died. The study concluded that early respiratory involvement, high CPK and severe myalgia suggest a severe form of dengue myositis [10].

Although in medical literature myositis following dengue illness is rare, we believe that many patients with dengue illness present with myalgia and the presence of myositis may not have being biochemically detected and may be under reported. We suggest that reviews of serum CK levels in a large cohort of patients with dengue virus infection would be necessary to confirm this impression and can be followed by histological evaluation and EMG for confirmation.

We suggest that patients with dengue illness with myalgia should have serum creatinine kinase levels measured and urinalysis done for hemagglutination for early diagnosis of myositis which might be complicated with rhabdomyolysis and acute renal failure. If myositis and rhabdomyolysis detected early, potential complications can be prevented.

Conclusions

We describe dengue virus as a rare but potential cause for acute myositis. Similar to viruses well known to cause myositis, dengue is associated with a viraemic phase with prostration and myalgia. Patients with dengue illness with myalgia should have serum creatinine kinase levels measured and urinalysis done for hemagglutination for early diagnosis of myositis which might be complicated with rhabdomyolysis and acute renal failure, which are potentially preventable complications.

Consent

Written informed consent was obtained from the patient for publication of this case report.

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Abbreviations

CPK: Creatinine Phosphokinase

NF: Tumor Necrosis Factor

EMG: Electromyogram

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

CD, UR, and TJ participated in acquisition of data. CD and UR were involved in drafting the manuscript. CD, UR and TJ participated in revising the manuscript critically and giving final approval of the version to be published. All authors read and approved the final manuscript.

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