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Dengue Fever Presenting with Severe Myositis-A Case Report

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Abstract: Dengue fever is one of the most common vector-borne diseases, which is a viral infection transmitted by female Aedes aegypti mosquitoes. It is most common in tropical countries like India. Dengue fever symptoms can range from a mild infection to severe flu-like sickness. Myalgia is a symptom of dengue infection. Dengue fever with myositis and/or high serum creatine phosphokinase (CPK) levels, on the other hand, is extremely uncommon. Dengue virus can cause myositis in many mechanisms. One of the most common mechanisms is by direct invasion of the myocytes by the dengue viruses. Myotoxins, Inflammatory cytokines have also been a part of the development of myositis. The clinical spectrum is broad, from the mild asymmetrical weakness of lower extremities to sudden progressive severe limb and trunk weakness, and even lung failure. This case study aims to show the rare neuromuscular complications of dengue fever, which can be managed well with a high index of suspicion. Our patient presented with fever and severe myalgia and was diagnosed with dengue. We started treating the patient with a provisional diagnosis of dengue-associated myositis. Significantly elevated CPK levels confirmed the myositis. Hereby, we are presenting a case of dengue fever with myositis with muscle weakness & elevated creatine phosphokinase (CPK) levels who recovered completely with early suspicion of dengue-associated myositis and early management. Hence, Physicians should have a high index of suspicion and early management of dengue-associated neuromuscular complications.

Keywords: Dengue, Neuromuscular complications of Dengue, Myalgia, Myositis, Elevation of Creatine phosphokinase(CPK)

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1. INTRODUCTION

In tropical countries like India, Dengue is one of the most common epidemics and vector-borne diseases. Dengue viruses (DENV) have four serotypes [DENV1, DENV2, DENV3, and DENV4]. It is transmitted through the bite of an infected mosquito. Dengue fever has a wide range of clinical spectrum, generally ranging from a viral fever to hemorrhagic symptoms that can also lead to shock in most severe cases—for example, Dengue hemorrhagic fever and Dengue shock syndrome[1]. Risk factors include age, host immune status & viral strain. Especially patients get infected many times with different strains of dengue, leading to primary or secondary infections, which influence the clinical presentation. Biphasic fever, myalgia, arthralgia, and rash are some noted symptoms[2]. In addition, dengue fever (the so-called BREAK BONE fever) can cause muscular complications like myalgias, myositis in which there will be an increased serum creatine phosphokinase (CPK), Rhabdomyolysis, Hypokalemic paralysis as rare complications. This article presents a patient with dengue infection, fever, and myositis with CPK levels elevated [3]. The following case report mainly focuses on unusual and rare presentations of dengue, and we need to have a comprehension of all rare manifestations of dengue as dengue infection is common in India and other tropical countries; with timely diagnosis & proper management, we can prevent these complications & complete recovery of the patient is possible.

2. CASE REPORT

A 41 -year old female came to OPD with a history of acute onset fever for three days and severe pain in both the thighs & calf muscles with limitation of movement for one day. On day 3 of the fever, she developed severe pain in both the thighs & calf muscles which was sudden in onset, progressively increasing characteristics of pain, non-radiating, which is severe enough to limit her daily activities. She had no complaints of cold, cough, pain in the abdomen, altered bowel habits, dysuria, vision loss, slurring of speech, or bowel and bladder incontinence. No bleeding tendency or neurological symptoms were observed.

3. MEDICAL HISTORY

No significant present and past history. No history of trauma or similar complaints in the past. No previous history of drug allergies. No history of blood transfusions. No history of surgeries in the past.

4. OBSERVATION

Her vitals were stable. On examination, calf and thigh muscles were slightly swollen, and tenderness was present. Painful movement of the legs was present. There was mild weakness limited to lower limbs which were asymmetrical. The patient had limitations in the movement of limbs throughout the range of motion due to pain. The pain was graded as severe on the numeric pain rating scale. No signs of bleeding diathesis were noted.

5. COURSE DURING HOSPITAL STAY

The patient was admitted, and routine investigations were sent and managed symptomatically initially. The Investigations of the patient showed a Platelet count of 1.1lakhs (normal range 1.5 to 4 lakhs), LFT report showed slightly elevated enzymes (AST/SGOT-102 and ALT/SGPT-75). Her chest radiograph is also normal. Both dengue-specific immunoglobulin (IgM) & dengue nonstructural protein (ns-1) antigen results were Positive. CPK levels were 2807 (elevated). FBS, RFT, and serum electrolytes were normal. Antinuclear antibody (ANA), Human immunodeficiency virus (HIV), and anti-neutrophil cytoplasmic antibody (ANCA) were negative. Neuroimaging was done, and it showed no abnormality. EMG was not done in this patient as the platelets were low, and myositis can be easily diagnosed with significantly elevated CPK levels.

6. DIAGNOSIS

The patient clinically had symptoms of dengue and myositis. The clinical picture is supported by laboratory evidence, such as a positive NS-1 antigen and positive dengue-specific IgM. In addition, myositis is supported by elevated levels of CPK. Hence the diagnosis of dengue fever complicated with myositis was made.

7. TREATMENT

After the diagnosis of dengue fever complicated with myositis, the patient was treated as per standard dengue management. The patient was supportively treated with I.V. fluids; Acetaminophen was given for pain management. Daily assessment of weakness of limbs or any progression of limb weakness to upper limbs and trunks was done.

8. PROGNOSIS

There was a significant reduction of pain in the calf and thigh, and motion improvement was noted along with a reduction in pain. This was also reflected in a reduction in Serum CPK values from 2807 IU/L to 176 IU/L over seven days. In addition, platelet levels improved to 2.5 lakhs. All four limb movements were normal without pain, the patient improved symptomatically, and the patient was discharged.

9. FOLLOWUP

The patient generally recovered without any residual weakness. The patient has been followed up for the next three months regularly, showing complete improvement of weakness and no recurrence. This study concludes that dengue fever should be considered a differential diagnosis for patients presenting with fever & severe myalgia.

Table 1: The summary of various case reports and case series of dengue with myositis in various age groups, presentations, clinical manifestation, lab investigations and management.

Reference	Age/sex	preceding illness	duration of illness	clinical manifestations	lab tests(platelets)	serum CPK	EMG	Muscle biopsy	treatment	outcome
Beauvais et al., 199312	7/M	Fever	4days	severe calf pain	1.24L	83,1000	NO	NO	Symptomatic	improved
Kalita et al.,200513	38/m 35/m 13/f 42/m 9/f 35/m 32/m	fever and myalgia			6 had a low platelet count mean of 60,000	590 260 550 346 3050 282 812	normal in except one who has myopathy	the same has perifascicular myonecrosis	symptomatic	six improved spontaneously, and one took 3 months to recover
Misra et al.,200614	56/M	Fever, headache, vomiting, altered sensorium, oliguria	2days	not mentioned	16,0000	3260	no	no	IV fluids, platelet transfusion, H.D.	Died of MODS
	30/M	fever, myalgia, headache	4 days	Quadriparesis	20K	3050	NO	NO	symptomatic	improves
	35/m	fever, headache	5d	Quadriparesis	14k	812	no	no	platelets transfusion	improved
Finsterer and Kongchan, 2006.	30/m	Fever, myalgia, headache	5d	Severe myalgia	52K	162	NCV	NO	symptomatic	improved
Ahmad et al., 2007.16	5/F	High-grade fever , myalgia	3d	severe myalgias with difficulty in walking	92k	1400	no	no	symptomatic	improved
Acharya et al.,2010.15	40/f	fever and myalgia	5d	Flaccid, pure motor quadriparesis, with bilateral pharyngeal muscle weakness, head drop	88k	29000	myopathic	perifascicular myonecrosis	ventilatory support	improved
Sangle et al.,2010.	16/f	fever and body pains, rash	5d	Proximal muscles weakness in both upper and lower limbs 2D-echocardiogram was suggestive of myocardial dysfunction	80k	3101	myopathic	no	symptomatic	improved

Koshy et al., 2012.	50/m	fever	6d	myalgia	70k	5679	no	no	as per WHO guidelines	improved
Verma et al., 2017	20/m	fever	2d	severe myositis	3.2L	10,634	Myopathic	Inflammatory cell infiltrate in muscles	corticosteroids	improved
Paliwal et al., 2011.	24/m	fever and myalgia	30d	Quadriplegia, neck, trunk, and respiratory muscle weakness	1.9l	117200	early recruitment on EMG	Inflammatory cell infiltrate in muscles	VENTILATORY SUPPORT	FATAL
	27/M	Fever and myalgia	20d	Quadriplegia, neck, trunk, and respiratory muscle weakness	1.5l	23,380	early recruitment on EMG	Inflammatory cell infiltrate in muscles	VENTILATORY SUPPORT	FATAL
Pimentel et al., 2011.17	5/f	fever, malaise	5d	quadriparesis	no	620	no	no	supportive	improved
Hira et al.,2012.18	30/m	fever		motor weakness of limbs	42k	5098	myopathic	no	symptomatic	improved
Sardana and Gupta, 2012.19	23/m	high-grade fever	3d	Bilateral calf pain and progressive weakness of the lower extremities.	55k	3270	no	no	IV fluids, paracetamol and corticosteroids	complete recovery
Aggarwal et al.,2016.20	26/m	fever and severe myalgias	3d	Sudden onset asymmetrical weakness of all four limbs with severe myalgia	80k	12,590	no	no	conservative	complete recovery
Das et al.,2014.21	15/m	High-grade continuous fever, rash, arthralgia and myalgia	5d	Flaccid quadriparesis with right-sided Bell's palsy	90k	10000	myopathic	Inflammatory cell infiltrate in muscles	Methylprednisolone for three days, followed by oral prednisolone	complete recovery

10. DISCUSSION

Myositis caused by viral infections has been widely described in the literature. However, there are few cases with dengue and myosistis[4-9]. It has been postulated that myositis can be caused by interactions between host myocytes and virus, after a viral infection such as dengue fever in a variety of ways. It can occur due to specific receptors on specific organs highlighting the significance of certain organ involvement. Most likely, Dengue myositis can be caused by the invasion of viruses on myocytes resulting in the production of toxins[4]. In a study on swiss albino rats, the thigh muscles were cut out after the viral injection. According to an electron microscopic examination of the striated muscles, the sarcoplasmic reticulum network was rarefied, myofibrils were destroyed, and the mitochondria underwent alterations. The cytoplasm also included aggregates of electron-dense material and glycogen particles[8]. The myotubes infected also had increased

intracellular calcium content[9] Muscle satellite cells, which are in charge of healing damaged muscles, are susceptible to infection by the dengue virus. The inability of muscle satellite cells infected with the dengue virus to increase the amounts of myosin heavy chain I protein is another indication that an immune mechanism may be accountable for the muscle damage. [11] According to Misra et al., eight out of twenty-four dengue fever patients aged five to sixty-five years showed pure motor quadriparesis. These individuals exhibited normal Nerve Conduction Studies, despite having muscular weakness in all four limbs. Myositis is indicated by elevated serum CPK and myopathic EMG. CPK levels were increased in seven of the individuals in this group. These patients all recovered completely within two weeks[5]. Thirty patients with acute myopathy and elevated serum Creatinine phosphokinase (CPK) levels in a separate observational analysis in which the patients have a symmetrical weakness. Fever is present in seventeen of them. The aetiology in fourteen individuals was dengue fever; in others, the causes include pyomyositis, hypokalemia in thyrotoxicosis, and systemic lupus erythematosus[6]. Electrophysiological investigations were positive in eight cases, and muscle samples were abnormal in another eight. There are nine patients with normal levels. Myalgias were more common in people with normal potassium levels in their blood and have diminished tendon reflexes compared to patients with low potassium levels[7]. It was found that dengue-related myositis is more common in younger age groups. Most affected cases belong to the male sex [M: F=26:8]. The weakness onset is usually from three days to thirty-six days. The mean period of onset is 9.4 days. Weakness of muscles is commonly associated with myalgia. The levels of Serum Creatinine phosphokinase are generally elevated with a mean: of 10,558 IU/L, and the range varies from 162 to 1,17,200 IU/L. With an average recovery time of seven days, most patients had a spontaneous and complete recovery. Corticosteroids were used in some cases, but their role is insignificant and can be avoided.

11. CONCLUSION

Dengue myositis should be considered as one of the differentials in cases of acute flaccid paralysis in India and other tropical countries where dengue is more common. "The elevation of CPK levels is necessary for the diagnosis of dengue-associated myositis (table 1). EMG is not necessary for patients with low platelet count (table 1)". Dengue fever with myositis is usually benign. It can be distinguished from other causes of flaccid paralysis by the tenderness of the calf and thigh muscles, elevated Creatinine phosphokinase levels, and other normal neuromusculoskeletal system examination findings. Ventilatory support is used in respiratory muscle weakness (table 1). This above case report had relevance to all physicians as it emphasizes that myositis is a rare but possible manifestation of dengue & it can be very well managed with early recognition and suspicion; occasionally, corticosteroids are used.

12. AUTHORS CONTRIBUITION STATEMENT

Dr Nandhyala Durga Venkata Sainadh, Dr Manimekalai P, and Dr Vinatha MC conceived the presented idea. Dr Nandhyala Durga Venkata Sainadh developed the theory. Pujari Lokchaitanya & Pon Divya Bharathi provided valuable inputs. Finally, all authors discussed the results and contributed to the final manuscript.

13. CONFLICT OF INTEREST

Conflict of interest declared none.

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