# Necrotizing autoimmune myopathy

Sir,

We wish to describe a rare case of autoimmune necrotizing myopathy (ANM) in a patient who was admitted to our hospital recently. She had a subacute myopathy with weight loss and cardiac involvement. Blood levels of creatine kinase (CK) and a muscle biopsy clinched the diagnosis of this potentially treatable condition and she responded to treatment. As necrotizing autoimmune myopathy is a rare and potentially treatable myopathy with only 300 cases reported worldwide, we are describing her case below.

A 17-year-old girl presented with history of intermittent fever of 2 months duration followed by myalgia, walking difficulty, weakness, loss of appetite, and vomiting. There was no history of any intake of statins, indigenous drugs, or any medication prior to this illness. There was no history of skin rashes, oral ulcers, photosensitivity, alopecia, polyarthritis, loss of weight or any malignancy prior to this illness or any malignancy prior to this illness. There was no history of exanthematous rash, conjunctivitis, jaundice, allergic rhinitis, cough or urticaria. She was mostly confined to bed by the time she presented to us. On initial examination, the patient was thin-built, her temperature was 100.4°F, pulse was 100/min, and blood pressure (BP) was 120/80 mmHg. There was no skin rash, jaundice, oral ulcer, lymphadenopathy, polyarthritis, or hepatosplenomegaly. Cardiovascular (CVS) system, respiratory system, and examination of the abdomen were normal. Local examination revealed tenderness in the anterior and lateral aspects of both the thighs.

On neurological examination, the higher mental functions and cranial nerves were normal. On motor system examination, there was muscle tenderness with grade 3/5 power in all muscles of the bilateral lower limbs. Initial investigations revealed elevated CK levels (1,660 IU/L) with polymorphonuclear leukocytosis [total leukocyte count (TLC) 12,200/mm$^3$] and raised C-reactive protein (CRP) levels. X-ray of the chest and ultrasound (USG) of the whole abdomen were normal. Viral antibody screening for human immunodeficiency virus (HIV), hepatitis B surface antigen (HBs Ag), hepatitis C virus (HCV), and dengue virus was negative. Autoantibody tests such as antinuclear antibody (ANA), anti-doubled stranded (ds)DNA, c-antineutrophil cytoplasmic antibody (ANCA), p-ANCA, and ANA profile including antisynthetase antibody were negative. Anti-signal recognition particle (SRP) and anti-HMG-CoA antibody antibodies were not tested due to nonavailablity of tests in our laboratory. Moreover,

monitoring of these antibodies was not considered to be cost-effective. USG of the thigh was suggestive of myositis. Electromyography (EMG) of the thigh muscles was consistent with myopathy with no spontaneous activity. On magnetic resonance (MR) imaging of the thigh, the *vastus lateralis*, *intermedius*, *adductor longus*, and *adductor magnus* appeared bulky. There was T2 and short tau inversion recovery (STIR) hyperintensity along the muscle fibers with diffuse edema in the musculofascial and subcutaneous planes suggestive of myositis along the anteromedial compartment of the right thigh [Figure 1 — edema sign]. Muscle biopsy showed preserved myofibrillar architecture and fiber typing [Figure 2]. Interspersed between myofibrils, on immunohistochemical studies CD 68 positive histiocytes were seen [Figure 3]; HLA 1 and 2 showed mild overexpression of the latter on the sarcolemmal membrane [Figure 4]. Over the following days, the patient developed hypotension with significant weakness of neck flexors. She had elevated CK levels (2,430 IU/L) and creatine kinase MB (CK-MB) levels (26 IU/mL). Two-dimensional (2D) echocardiogram showed hypokinesia of all cardiac segments with a left ventricular ejection fraction (LVEF) of 40%. This patient was treated with pulse methylprednisolone and later oral prednisolone 1 mg/kg. Her motor power improved to grade 4/5; on follow-up she received mycophenolate mofetil 500 mg/day, along with a tapering regimen of prednisolone. The patient had a steady functional recovery in response to steroids and the most recent follow-up (1 week back) showed grade 5/5 power and normal CK value. USG imaging of the thigh muscles performed during the illness was suggestive of myositis in the anteromedial compartment of the right thigh and USG of muscles performed 4 weeks after treatment showed complete resolution of inflammatory features.

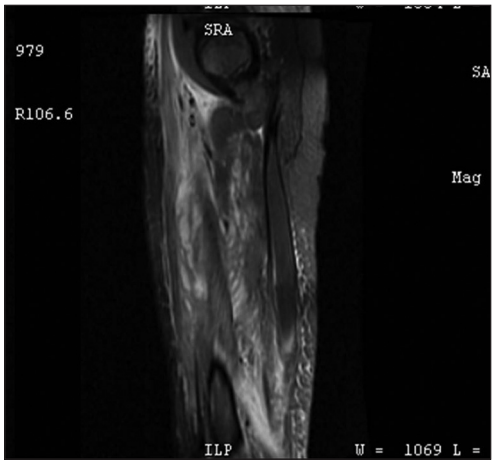


**Figure 1: MRI imaging — *vastus lateralis, intermedius*, and *adductor* muscles appeared bulky — altered signal intensity in the form of T2 and stir hyperintensity (edema sign)**

ANM, a subgroup of inflammatory myopathies distinguished by minimal inflammation on histopathology, was first reported by Emslie-Smith and Engel.[1] In 2004, the Muscle Study Group proposed a separate classification for this emerging entity and the terminology of ANM was introduced taking into consideration its immunopathological, histological, and clinical aspects.[1]

Diagnostic criteria for acute necrotizing inflammatory myopathy adapted from the European Neuromuscular Centre International workup on Idiopathic Inflammatory Myopathies requires a subacute onset of proximally predominant muscle weakness, elevated CK levels, and abnormal EMG coupled with muscle biopsy showing necrotic muscle fibers with minimal

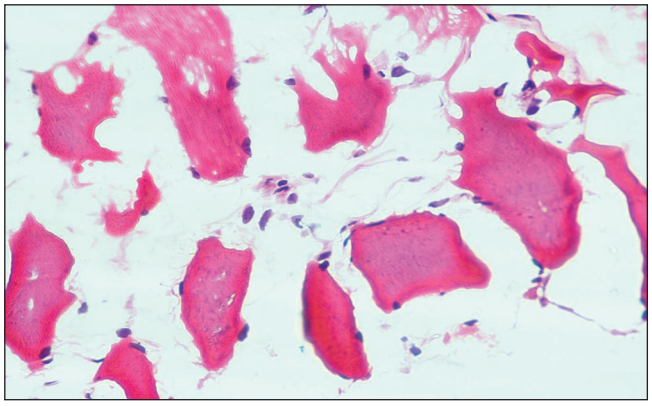

**Figure 2: H E SLIDE X 10 — showed necrotic muscle fibers without inflammatory infiltrate**

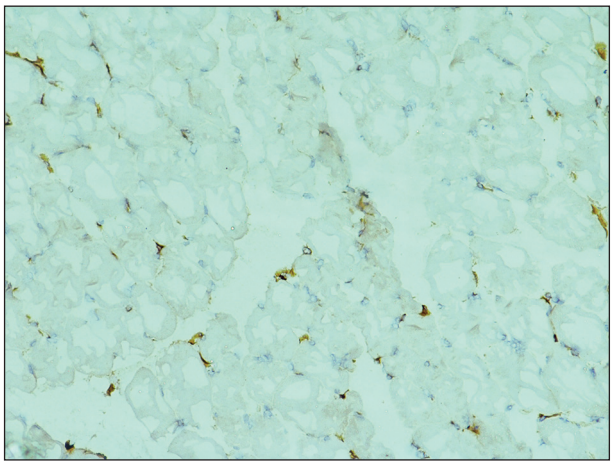

**Figure 3: Immunohistochemistry shows CD68 macrophage marker positive (brown) cells interspersed between myocytes**

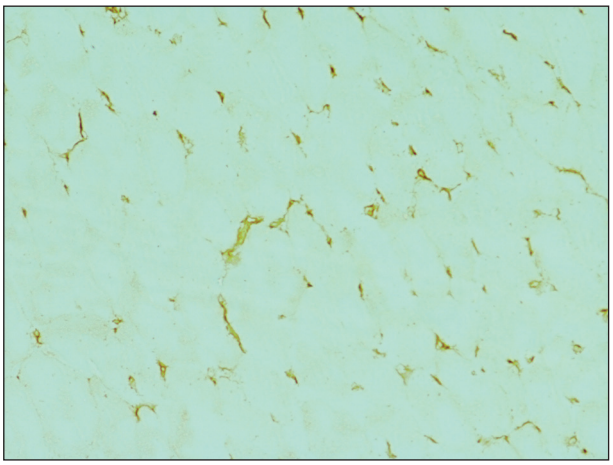

**Figure 4: HLA typing — HLA 2 showed some overexpression on sarcolemmal membrane**

or no inflammatory infiltrates.[2-4] Our patient fulfilled the diagnostic criteria for the diagnosis of acute inflammatory autoimmune myopathy.

Proximal muscle weakness occurs, along with neck flexor, pharyngeal, and respiratory muscle involvement.[2,4] Other manifestations include fatigue, weight loss, and dysphagia.[2-4] Dyspnea and neuromuscular respiratory weakness are described in 33% of the cases.[2,4] Interstitial lung disease and cardiac involvement have been reported.[2,4] These abnormalities are reversed with immunosuppressive treatment.[5] Laboratory evaluation discloses high levels of CK with myopathic findings on electromyography.[1,2,4] STIR images show abundant edema in the musclofascial planes, a finding which is characteristic of this disease (edema sign). On pathologic examination, muscle fibers are necrotic with a pauciimmune inflammatory infiltrate and infiltration with histiocytes.[1-3] The cause for acute necrotizing myopathy is multifactorial.[2-4] Fifty percent of the patients have no identifiable risk factors.[2-4] Anti-SRP antibody has been described as a marker of ANM, especially when related to the use of statins.[2,4]

The course is often self-limiting and recovery occurs following treatment with intravenous or oral steroids and immunosuppressants such as mycophenolate mofetil or rituximab.[2,5] Reviewing the literature, ANM is a very rare disease.[1,4] In this communication, we have highlighted the salient features of this eminently treatable condition.

**Financial support and sponsorship**
Nil.

**Conflicts of interest**
There are no conflicts of interest.

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**Quick Response Code:**

**Website:** www.annalsofian.org

**DOI:** 10.4103/0972-2327.176864

**How to cite this article:** Babu SS, Khanna L, Saran RK, Mittal G, Peter S, Sebastian I. Necrotizing autoimmune myopathy. Ann Indian Acad Neurol 2016;19:288-90.
**Received:** 13-11-15, **Revised:** 13-11-15, **Accepted:** 13-11-15