



Patient Safety: Statins and Immune-Mediated Necrotizing Myopathy

From the AANEM Quality and Patient Safety Committee

Question: A 66 year old man with hypothyroidism is referred for an evaluation of severe muscle pain and proximal leg weakness which started shortly after initiating simvastatin treatment. Which of the following is most helpful to differentiate a toxic necrotizing myopathy from an immune mediated necrotizing myopathy?

- A. anti-HMG-CoA-reductase antibodies
- B. elevated CK levels
- C. irritable myopathy on EMG
- D. necrotic myofibers on muscle biopsy

Answer: A) anti-HMG-CoA-reductase antibodies

Explanation: Statin therapy can commonly cause elevated CK levels and myalgias; rarely, severe muscle pain and weakness can develop, most commonly in the first few months of treatment. These symptoms may be caused by either a toxic necrotizing myopathy (TNM) or an immune mediated necrotizing myopathy (IMNM) from statin exposure. It is critical to differentiate these two conditions because the former usually resolves on its own with statin discontinuation, whereas IMNM also requires treatment with immunomodulatory therapy.

Both conditions present similarly, with muscle pain and weakness. Both will show an irritable myopathy on EMG and elevated CK levels. Muscle biopsy in both conditions can show necrotic muscle fibers, but deposition of complement membrane attack complex on both non-necrotic myofibers and capillaries is suggestive of IMNM. Anti-HMG-CoA-reductase antibodies are specific for IMNM and are not usually found in TNM.

Supporting Articles:

Doughty CT, Amato AA. Toxic Myopathies. *Continuum* 2019;25:6:1712–1731.

Goyal NA. Immune-mediated myopathies. *Continuum* 2019;25:6:1564-1585.

Hopewell JC, Offer A, Haynes R, et al. Independent risk factors for simvastatin-related myopathy and relevance to different types of muscle symptom. *Eur Heart J* 2020 41(35):3336-3342.

Meyer A, Troyanov Y, Drouin J, et al. Statin-induced anti-HMGCR myopathy: successful therapeutic strategies for corticosteroid-free remission in 55 patients. *Arthritis Res Ther* 2020 8;22(1):5.

Ochs-Bacom HM, Nguyen LM, Ma C, et al. Clinical features related to statin-associated muscle symptoms. *Muscle Nerve* 2019 59:537-543.

Authors:

Nida G. Gleveckas-Martens DO, MS; Gregory Gruener, MD, MBA, MHPE