Case study

Increased lipid peroxidation in a patient with CK-elevation and muscle pain during statin therapy

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Muscle pains, CK-elevation and, rarely, rhabdomyolysis may occur during HMG-Co-enzyme-A-reductase inhibitor therapy. The underlying pathogenetic mechanisms are not yet identified. Recently, we reported a patient who showed symptoms of muscle pains during statin therapy which improved when he received vitamin E [1]. After submitting that manuscript, Holt et al. described an increase in lipid peroxidation in patients with rhabdomyolysis [2] using 8-epi-prostaglandin (PG)F2α as a determinant for in-vivo oxidation injury [3,4].

Recently, in our clinical practice we identified a patient suffering from severe familial hypercholesterolemia (male; GH, 54 a; 184 cm:180 kg) without any other risk factor who experienced severe muscle pain on lovastatin 40 mg/day with CK-elevation (329 U/l). We proceeded to measure the isoprostane 8-epi-PGF2α in plasma, serum and urine as a measure of in-vivo oxidation injury at the time of onset of pain, after withdrawal of the drug (Fig. 1), and throughout the following 3 months. 8-epi-PGF2α in plasma, serum and urine was increased strikingly. Withdrawing the drug resulted in a stepwise decrease in the respective values, almost normalizing within 2, and completely normalizing within 4 weeks. CK rapidly normalized as well. Changing to atorvastatin had no adverse effect on 8-epi-PGF2α, which has continued to remain normal until now (>6 months).

Our findings show for the first time that during the symptomatic period of muscle pains with CK-elevation during statin therapy, 8-epi-PGF2α is severely increased indicating a significant in-vivo oxidation injury. As lipid lowering drugs are known to improve 8-epi-PGF2α either directly or indirectly via lipid lowering [5], the effect described cannot be due to the drug itself. The extent of the increase was clearly associated with the extent of symptoms seen in the patient. There is no information available yet as to whether the individual antioxidant status is relevant for the development of muscular side effects [6]. These findings, however, explain the benefit of vitamin E-therapy seen in one patient with similar side effects [1]. The role of antioxidant status and antioxidants thus needs to be assessed in detail in patients suffering from various side effects under statin treatment.

![Fig. 1. 8-Epi-PGF₂α drops immediately after stopping statin therapy in urine, plasma and serum.](image-url)
References


