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The Effect of Simvastatin Treatment on Plasma Ubiquinone, Blood ATP Concentrations, Total Antioxidant Capacity and Muscle Related Markers

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Abstract: It has been hypothesized that treating hypercholesterolemic patients with statins will lead not only to a reduction in cholesterol, but also to inhibited synthesis of other compounds that derive from the synthetic pathway of cholesterol. One important by-product is ubiquinone (CQ), which has a pivotal role in mitochondrial electron transport and antioxidant activity. We therefore investigated the effect of 2 months of simvastatin treatment (20 mg/day) on blood ATP concentration, plasma total antioxidant capacity and ubiquinone levels in 17 hypercholesterolemic patients (age range: 40 to 65). To evaluate the possible muscle-related side effects, plasma CK activity and myoglobin concentrations were compared before and after therapy. We observed decreased plasma ubiquinone levels and total antioxidant capacity after two months of therapy. CK activity and myoglobin concentrations were increased in the treated group. There was not statistically significant difference for whole blood ATP levels. It may be concluded that simvastatin lowers plasma ubiquinone concentrations . The possible adverse effect of simvastatin on ubiquinone metabolism may be clinically important and requires further study.

Key Words: Ubiquinone, HMG CoA reductase inhibitors, ATP, antioxidant

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