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Primary and secondary coenzyme Q10 deficiency: the role of therapeutic supplementation.

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Abstract

Coenzyme Q10 (CoQ10) is the only lipid-soluble antioxidant that animal cells synthesize de novo. It is found in cell membranes and is particularly well known for its role in the electron transport chain in mitochondrial membranes during aerobic cellular respiration. A deficiency in either its bioavailability or its biosynthesis can lead to one of several disease states. Primary deficiency has been well described and results from mutations in genes involved in CoQ10 biosynthesis. Secondary deficiency may be linked to hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (statins), which are used for the treatment of hypercholesterolemia. Dietary contributions of CoQ10 are very small, but supplementation is effective in increasing plasma CoQ10 levels. It has been clearly demonstrated that treatment with CoQ10 is effective in numerous disorders and deficiency states and that supplementation has a favorable outcome. However, CoQ10 is not routinely prescribed in clinical practice. This review explores primary as well as statin-induced secondary deficiency and provides an overview of the benefits of CoQ10 supplementation.

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