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## Can coenzyme q10 improve clinical and molecular parameters in fibromyalgia?

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#### Abstract

Fibromyalgia (FM) is a complex disorder that affects up to 5% of the general population worldwide. Its pathophysiological mechanisms are difficult to identify and current drug therapies demonstrate limited effectiveness. Both mitochondrial dysfunction and coenzyme Q10 (CoQ10) deficiency have been implicated in FM pathophysiology. We have investigated the effect of CoQ10 supplementation. We carried out a randomized, double-blind, placebo-controlled trial to evaluate clinical and gene expression effects of forty days of CoQ10 supplementation (300 mg/day) on 20 FM patients. This study was registered with controlled-trials.com (ISRCTN 21164124). An important clinical improvement was evident after CoQ10 versus placebo treatment showing a reduction of FIQ ( $p < 0.001$ ), and a most prominent reduction in pain ( $p < 0.001$ ), fatigue, and morning tiredness ( $p < 0.01$ ) subscales from FIQ. Furthermore, we observed an important reduction in the pain visual scale ( $p < 0.01$ ) and a reduction in tender points ( $p < 0.01$ ), including recovery of inflammation, antioxidant enzymes, mitochondrial biogenesis, and AMPK gene expression levels, associated with phosphorylation of the AMPK activity. These results lead to the hypothesis that CoQ10 have a potential therapeutic effect in FM, and indicate new potential molecular targets for the therapy of this disease. AMPK could be implicated in the pathophysiology of FM.

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