

Abstract

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A randomized, double-blinded, placebo-controlled, crossover, add-on study of CoEnzyme Q10 in the prevention of pediatric and adolescent migraine.

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OBJECTIVE: To evaluate the efficacy of Coenzyme Q10 (CoQ10) supplementation in the prevention of migraine in children using a placebo-controlled, double-blinded, crossover, add-on trial.

BACKGROUND: CoQ10 has been demonstrated to have efficacy in migraine prevention in adults but lacks pediatric research with more rigorous methodology. CoQ10 has been observed to be deficient in a significant number of children and adolescents presenting to tertiary headache centers. **CoQ10 has the potential to modify both the inflammatory changes that occur during recurrent migraine and the alteration of mitochondrial function.** A deficit of CoQ10 could thus affect the response to treatment and clinical characteristics of migraine in children and adults.

METHODS: One-hundred-and-twenty children and adolescents with migraine headache were randomized in a crossover, double-blind, placebo-controlled, randomized, add-on study to receive a placebo or CoQ10 (100 mg) supplement for 224 days. Data for 76 patients were available at the crossover point and 50 were analysed at the endpoint. Response to treatment, overall headache improvement, and headache disability were assessed.

RESULTS: **Both the placebo and CoQ10 groups showed reduced migraine frequency** [F(1, 60) = 15.68, $p < 0.001$], severity [F(1, 54) = 8.09, $p = 0.006$], and duration [F(1, 45) = 6.27, $p = 0.016$] over time. **CoQ10 treated patients had a significantly greater improvement in frequency from subject reported baseline starting within 4 weeks of initiation.** No group differences comparing the first 4 weeks of treatment with the last 4 weeks of treatment were found in migraine frequency [F(1, 60) = 2.34, $p > 0.05$], severity [F(1, 54) = 0.06, $p > 0.05$], or duration [F(1, 45) = 0.14, $p > 0.05$].

CONCLUSIONS: Overall, results of the study demonstrate that children and adolescents with migraine improved over time with multidisciplinary, standardized treatment regardless of supplementation with CoQ10 or placebo. **There was no difference in headache outcomes between the CoQ10 and placebo groups at day 224.** Due to the improvements seen in weeks 1-4, CoQ10 may lead to earlier improvement in headache severity, but given the sample size this conclusion warrants further investigation with a larger sample.

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