

# Coenzyme Q10 Deficiency and Response to Supplementation in Pediatric and Adolescent Migraine

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**Background.**—Coenzyme Q10 (CoQ10) has been suggested to be effective in the prevention of migraine, and levels can be quantified with standardized reference ranges.

**Objective.**—This study documents the prevalence of CoQ10 deficiency in migraine headache and examines the potential effectiveness of supplementation.

**Methods.**—We assessed patients attending a tertiary care center with frequent headaches for CoQ10 deficiency. We recommended patients with low CoQ10 levels begin supplementation with CoQ10 as part of their multidisciplinary treatment plan. We assessed response to treatment including correction of CoQ10 deficiency, overall headache improvement, and headache disability.

**Results.**—CoQ10 was measured in 1550 patients (mean age  $13.3 \pm 3.5$ , range 3 to 22 years). The mean total CoQ10 level was  $0.60 \pm 0.20 \mu\text{g/mL}$  (range 0.21 to  $1.77 \mu\text{g/mL}$ ). Of these patients, 32.9% were below the reference range. Patients with low CoQ10 were recommended to start 1 to 3 mg/kg per day of CoQ10 in liquid gel capsule formulation. In a subset of patients who returned for timely follow-up (mean, 97 days), the total CoQ10 level improved to  $1.20 \pm 0.59 \mu\text{g/mL}$  ( $P < .0001$ ), while the headache frequency improved from  $19.2 \pm 10.0$  to  $12.5 \pm 10.8$  ( $P < .001$ ) and headache disability assessed with PedMIDAS improved from  $47.4 \pm 50.6$  to  $22.8 \pm 30.6$  ( $P < .001$ ).

**Conclusions.**—Deficiency of CoQ10 may be common in pediatric and adolescent migraine. Determination of deficiency and consequent supplementation may result in clinical improvement. Further analysis involving more scientifically rigorous methodology will be required to confirm this observation.

**Key words:** headaches, pediatric disorders, pain

**Abbreviations:** Coenzyme Q10 CoQ10, PedMIDAS pediatric migraine disability Assessment, ICHD-II International classification of headache disorders, 2nd edition

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