Coenzyme Q10 deficiency in patients with Parkinson's disease.

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BACKGROUND: Reactive oxygen species (ROS) are well known to contribute to the pathophysiology of Parkinson's disease (PD). Clinical trials of antioxidants are currently underway in PD patients, however, antioxidant research has been hindered by a lack of peripheral biomarkers.

METHODS: Twenty-two patients with PD elected to have a novel antioxidant assessment (Functional Intracellular Assay (FIA), SpectraCell Lab, Houston, TX) performed between 2004 and 2008. Each PD case was compared to four age- and gender-matched controls (n=88) in four separate, random iterations using laboratory data submitted during the same time period. Logistic regression was used to determine the odds of functional deficiency in antioxidant nutrients (i.e., glutathione, coenzyme Q10, selenium, vitamin E and alpha-lipoic acid) by case-control status. The proportion of cases with functional deficiency was also compared to that for controls by chi(2) test.

RESULTS: Compared to cases, PD patients had a significantly greater odds of deficiency in coenzyme Q10 status (OR: 4.7-5.4; 95% CI: 1.5-17.7; P=0.003-0.009) based on FIA results, but not of vitamin E, selenium, lipoic acid, or glutathione (all P>0.05). The proportion of cases with coenzyme Q10 deficiency was also significantly greater in cases than in controls (32-36% vs. 8-9%; P=0.0012-0.006).

CONCLUSIONS: Deficiency of coenzyme Q10 assessed via FIA should be explored as a potential peripheral biomarker of antioxidant status in PD.

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