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Quiz Title: Parkinson Disease & Coenzyme Q10: A Connection

1. True or False. Clinical evidence has indicated abnormally high levels of coenzyme Q10 (CoQ10) in the mitochondria of Parkinsonian patients.

- A. True
- B. False

ANSWER: B. False

EXPLANATION: CoQ10 is an essential cofactor in reduction/oxidation (redox) reactions at the level of cell mitochondria. As reported by Testai and colleagues, clinical evidence has demonstrated low levels of CoQ10 in the mitochondria of Parkinsonian patients.

2. True or False. A clinical application of CoQ10 in Parkinson's disease (PD) is linked to this molecule's antioxidant and neuroprotective activity.

- A. True
- B. False

ANSWER: A. True

EXPLANATION: Because of its antioxidant activity and ability to reduce oxidative stress, CoQ10 has been proposed for clinical use in PD and other neurodegenerative conditions. According to Testai et al., CoQ10 demonstrated a neuroprotective activity on nigrostriatal dopaminergic neurons in PD.

3. True or False. Early clinical trials that evaluated CoQ10 in PD showed either symptomatic improvement or neuroprotective effects depending on the coenzyme dose tested

- A. True
- B. False

ANSWER: A. True

EXPLANATION: Two placebo-controlled, double-blind clinical trials have tested different doses of CoQ10 supplementation in PD. One study showed a significant but mild symptomatic benefit when using 360 mg/day of CoQ10 for 4 weeks compared with a placebo in Parkinsonian patients; another study demonstrated that a 16-month-long treatment with 1200 mg/day of CoQ10 reduced the worsening of early-stage PD, and greatly improved patients' daily routine activities.

4. True or False. CoQ10 supplementation in patients with mid-stage PD was not found effective in improving disease symptoms.

- A. True
- B. False

ANSWER: A. True

EXPLANATION: CoQ10 supplementation (300 mg/day for 3 months) in 106 patients with mid-stage PD treated with levodopa and without motor complications did not produce any significant changes in the Unified Parkinson's Diseases Rating Scale (UPDRS), even though all patients had increased serum CoQ10 levels. As explained by Testai et al, these data suggested that "in a mid-stage of PD, the CoQ10 supplementation does not induce symptomatic effects."

5. True or False. The reduced form of CoQ10 (ubiquinol-10) was shown to be effective in improving PD symptoms in patients experiencing levodopa "wearing-off".

- A. True
- B. False

ANSWER: A. True

EXPLANATION: s shown in a randomized, double-blind, placebo-controlled, parallel-group pilot trial, 300 mg/day of ubiquinol-10 given for 48 weeks significantly decreased UPDR scores more than placebo in patients with PD experiencing levodopa "wearing-off", suggesting an improvement of symptoms in this population. The same study did not find an equal dose of ubiquinol-10 given for 96 weeks beneficial in patients with early-phase PD not treated with levodopa.

This quiz is based on:

Testai L, Martelli A, Flori L, Cicero AFG, Colletti A. Coenzyme Q10: Clinical applications beyond cardiovascular diseases. *Nutrients*. 2021;13(5):1697. doi: 10.3390/nu13051697