



COENZYME Q10 SUPPLEMENTATION MODULATES NFκB AND NRF2 PATHWAYS IN EXERCISE TRAINING

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This study reports the effects of Q10, coenzyme Q10 or ubiquinone, a component of the electron transport chain in mitochondria, on nuclear factor kappa-light-chain-enhancer of activated B cells (NFκB), inhibitors of kappa B (IκB), nuclear factor (erythroid-derived 2)-like 2 (Nrf2) and hemeoxygenase 1 (HO-1) in rats after exercise training. 8-week old male Wistar rats were assigned randomly to one of four treatments planned in a 2 x 2 factorial arrangement of two condition (sedentary vs. exercise training), and two coenzyme Q10 levels (0 and 300 mg/kg per day for 6 weeks). The expression levels of the target proteins were determined in the heart, liver and muscle, and biochemical parameters associated with protein, lipid and carbohydrate metabolism were investigated in plasma. When compared with sedentary group, significant decreases in heart, liver and muscle NFκB levels by 45%, 26% and 44% were observed in Q10 supplemented rats after exercise training, respectively, while the inhibitory protein IκB increased by 179%, 111% and 127% in heart, liver and muscle tissues. Q10 supplementation caused an increase in Nrf2 (167%, 165% and 90%) and HO-1 (107%, 156% and 114%) after exercise training in heart, liver and muscle tissues. No significant change was observed in any of the parameters associated with protein, carbohydrate and lipid metabolism, except that exercise caused a decrease in plasma triglyceride, which was further decreased by Q10. In conclusion, these results suggest that Q10 modulates the expression of NFκB, IκB, Nrf2 and HO-1 in exercise training, indicating an anti-inflammatory effect of Q10 and emphasizes its role in antioxidant defense.

Keywords: Coenzyme Q10, Supplementation, Exercise, Training.