

# Carnitine status, plasma lipid profiles, and exercise capacity of dialysis patients: effects of a submaximal exercise program.

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## Abstract

Carnitine status, blood lipid profiles, and exercise capacity were evaluated in a combined group of hemodialysis (N = 4) and continuous ambulatory peritoneal dialysis (N = 6) patients before and after an 8-week submaximal exercise program. Maximal aerobic capacity (VO<sub>2</sub>max) was only 18.5 +/- 5.9 (mean +/- SD) mL O<sub>2</sub>/kg/min, well below the expected 30 to 35 mL O<sub>2</sub>/kg/min for age-matched sedentary controls. Plasma short-chain acylated carnitine levels, which were two to three times normal values, were reduced after the exercise program, but the long-chain acylcarnitines were significantly reduced during acute exercise. Muscle biopsies of the vastus lateralis were performed at rest in five patients prior to and after the 8-week exercise program. Total carnitine in skeletal muscle was 3.09 (.076 SD) μmol/g ww, with only 11.3% acylated prior to the exercise program, which was much lower than the 4.25 +/- 1.27 μmol/g ww, with 28.5% acylated in a group of healthy athletic subjects (N = 28). Muscle free carnitine concentrations decreased significantly following the 8-week training period, with only a slight reduction in total carnitine. The percent of acylated carnitine was therefore significantly increased (P less than 0.05) from 11.3% to 25.2% after the experimental period. Pretraining carnitine palmitoyl transferase activity at rest was 0.57 +/- 0.28 nmol palmitoyl carnitine formed/5 min/mg mitochondrial protein, which was not changed by exercise training v 1.80 +/- 0.51 nmol/5 min/mg protein in 28 healthy normals (P less than 0.001). Free fatty acid concentrations were reduced significantly during acute exercise as a result of the exercise training program whereas other plasma lipids were not altered. (ABSTRACT TRUNCATED AT 250 WORDS)