

Quercetin Exercise Performance Clinical Study

Quercetin's Influence on Exercise Performance and Muscle Mitochondrial Biogenesis

Neiman DC, Williams AS et al. Med Sci Sports Exerc. 2009 Nov 13. [Epub ahead of print]

PURPOSE: To determine the influence of 2-weeks quercetin (Q) (1000 mg/day) compared to placebo (P) supplementation on exercise performance and skeletal muscle mitochondrial biogenesis in untrained, young adult males (N=26, age 20.2±0.4 y, VO₂max 46.3±1.2 ml.kg.min). **METHODS:** Utilizing a randomized, crossover design with a 2-week washout period, subjects provided blood and muscle biopsy samples pre- and post-supplementation periods, and were given 12-minute time trials on 15% graded treadmills following 60-min moderate exercise pre-loads at 60% VO₂max. **RESULTS:** Plasma quercetin levels rose significantly in Q vs. P during the 2-week supplementation period (interaction P-value<0.001). During the 12-minute trial, the net change in distance achieved was significantly greater during Q (2.9%) compared to P (-1.2%) (29.5±11.5 vs. -11.9±16.0 m, respectively, P=0.038). Skeletal muscle mRNA expression tended to increase (range of 16% to 25%) during Q vs. P for SIRT1 (interaction effect, P=0.152), PGC-1α (P=0.192), cytochrome C oxidase (P=0.081), and citrate synthase (P=0.166). Muscle mitochondrial DNA (mtDNA, relative copy number per diploid nuclear genome) increased 140±154 (4.1%) with Q compared to a -225±157 (6.0% decrease) with P (P=0.098). **CONCLUSIONS:** In summary, 1000 mg/d Q vs. P for two weeks by untrained males was associated with a small but significant improvement in 12-minute treadmill time trial performance, and modest but insignificant increases in the relative copy number of mtDNA and mRNA levels of four genes related to mitochondrial biogenesis.