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Oxidative stress contributes to muscular fatigue. GSH is the major intracellular antioxidant, the biosynthesis of which is dependent on cysteine availability. We hypothesized that supplementation with a whey-based cysteine donor [Immunocal (HMS90)] designed to augment intracellular GSH would enhance performance. Twenty healthy young adults (10 men, 10 women) were studied presupplementation and 3 mo postsupplementation with either Immunocal (20 g/day) or casein placebo. Muscular performance was assessed by whole leg isokinetic cycle testing, measuring peak power and 30-s work capacity. Lymphocyte GSH was used as a marker of tissue GSH. There were no baseline differences (age, ht, wt, %ideal wt, peak power, 30-s work capacity). Follow-up data on 18 subjects (9 Immunocal, 9 placebo) were analyzed. **Both peak power [13 ± 3.5 (SE) %, $P < 0.02$] and 30-s work capacity ($13 \pm 3.7\%$, $P < 0.03$) increased significantly in the Immunocal group, with no change (2 ± 9.0 and $1 \pm 9.3\%$) in the placebo group.** Lymphocyte GSH also increased significantly in the Immunocal group ($35.5 \pm 11.04\%$, $P < 0.02$), with no change in the placebo group ($-0.9 \pm 9.6\%$). This is the first study to demonstrate that prolonged supplementation with a product designed to augment antioxidant defenses resulted in improved volitional performance.

Note that this was done with whey protein; also note that no exercise training was involved – the subjects developed more power from whey protein alone. N-acetylcysteine is also a cysteine donor and one may speculate that the results from that might be as good.