

Consumption of an Oral Carbohydrate-Protein Gel Improves Cycling Endurance and Prevents Postexercise Muscle Damage

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Abstract

Investigators have reported improved endurance performance and attenuated post-exercise muscle damage with carbohydrate-protein beverages (CHO+P) versus carbohydrate-only beverages (CHO). However, these benefits have been demonstrated only when CHO+P was administered in beverage-form, and exclusively in male subjects. Thus, the purposes of this study were to determine if an oral CHO+P gel improved endurance performance and post-exercise muscle damage compared to a CHO gel, and determine if responses were similar between genders. Thirteen cyclists (8 men, 5 women; $\text{VO}_2\text{peak} = 57.9 \pm 7.0 \text{ ml} \times \text{kg}^{-1} \times \text{min}^{-1}$) completed two timed cycle-trials to volitional exhaustion at 75% of VO_2peak . At 15-minute intervals throughout these rides, subjects received CHO or CHO+P gels, which were matched for carbohydrate content (CHO = $0.15 \text{ g CHO} \times \text{kg BW}^{-1}$; CHO+P = $0.15 \text{ g CHO} + 0.038 \text{ g protein} \times \text{kg BW}^{-1}$). Trials were performed using a randomly counterbalanced, double-blind design. Subjects rode 13% longer ($p < 0.05$) when utilizing the CHO+P gel (116.6 ± 28.5 minutes) versus the CHO gel (102.8 ± 25.0 minutes). In addition, men (101.8 ± 24.6 ; 114.8 ± 26.2) and women (104.4 ± 28.6 ; 119.6 ± 34.9) responded similarly to the CHO and CHO+P trials, with no significant treatment-by-gender effect. Postexercise creatine kinase (CK) was not significantly different between treatments. However, CK increased significantly following exercise in the CHO trial (183 ± 116 ; $267 \pm 214 \text{ U} \times \text{L}^{-1}$), but not the CHO+P trial (180 ± 133 ; $222 \pm 141 \text{ U} \times \text{L}^{-1}$). Therefore, to prolong endurance performance and prevent increases in muscle damage, it is recommended that male and female cyclists consume CHO+P gels rather than CHO gels during and immediately following exercise.

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