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; VO(2)peak = 57.9 +/- 7.0 ml x kg(-1) x min(-1)) completed two timed cycle-trials to volitional exhaustion at 75% of VO(2)peak. At 15-minute intervals throughout these rides, subjects received CHO or CHO+P gels, which were matched for carbohydrate content (CHO = 0.15 g CHO x kg BW(-1); CHO+P = 0.15 g CHO + 0.038 g protein x 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 kinease (CK) was not significantly different between treatments. However, CK increased significantly following exercise in the CHO trial (183 +/- 116; 267 +/- 214 U x L(-1)), but not the CHO+P trial (180 +/- 133; 222 +/- 141 U x 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.