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Effect of whey protein on rehydration after exercise

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Objective The purpose of this study is to determine the effects of a rehydration solution containing whey protein on fluid balance after exercise-induced dehydration. The ACSM Sports Guide recommends that healthy adults exercise moderate-intensity aerobic exercise for 30 minutes a day. This type of exercise can dehydrate the body by about 1%. Dehydration 1% affects exercise capacity and performance. The purpose of this study was to exercise-induced dehydration of sports drinks containing whey protein.

Methods Twelve college students (20 ± 2 years, 169.9 ± 8.1 cm, 63.3 ± 13 kg) participated. Participants reduced body mass by (0.67 ± 0.33) after intermittent exercise and re-hydrated with a volume of drink in liter equivalent to 1.5 times their body mass loss in kilograms of a solution of 4 kinds of drinks: Distilled water (trial C), carbohydrate-electrolyte (trial D), carbohydrate-electrolyte-low whey protein (trial LWP) and carbohydrate-electrolyte-high whey protein (trial HWP). Solutions were matched for carbohydrate and electrolyte content in trial D, LWP and HWP. Trials were administered in a random, counterbalanced, crossover design, with subjects blinded as to which drink they consumed during each trial. Each participant completed 4 experimental trials, which were separated by at least one week. Urine samples were collected before and after exercise (immediately, 40, 80, 120, 160 minutes later). Urine volume, drink retention, urine osmolality and urine specific gravity were tested. Drink retention was calculated as difference between the volume of drink ingested and urine produced.

Results 1. Total cumulative urine output after exercise was not different between each of the four groups (C: 1002 ± 102 mL; D; LWP; ; HWP; , $p > 0.5$); 2. During the study, drink retention of trial LWP is the highest ($80.3 \pm 11.2\%$), but there was not different between each of the four groups (C: $70.5 \pm 20.6\%$; D: $70.7 \pm 17.9\%$; HWP: $75.0 \pm 12.4\%$, $p > 0.5$). 3. At the 40th minute after exercise, the urine specific gravity of the D was significantly lower than that of the LWP (1.020 ± 0.006 vs 1.028 ± 0.003 , $p = 0.020$), and the urine specific gravity of the LWP at 120 minutes after exercise significantly higher than the D (1.018 ± 0.003 vs 1.021 ± 0.007 , $p = 0.006$).

Conclusions When the amount of dehydration after exercise is 1%-2%, each kind of the drinks in the study is useful for rehydration, and the addition of whey protein does not increase rehydration.