Gastric Emptying Characteristics of Carbohydrate/Protein And Carbohydrate Only Sports Drinks During Moderate Intensity Exercise

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Previous research has shown that a carbohydrate-protein sports drink (CHOP) improves rehydration after exercise compared to a carbohydrate-only sports drink (CHO). However, little is known how composition of sports drinks impacts gastric emptying during exercise. Numerous gastric empting studies have been limited to sampling only at pre- and post-exercise. This study was completed by sampling $^{13}CO_2$ at regular intervals during exercise to assess gastric emptying rate during exercise.

PURPOSE: To compare the gastric emptying rate of a CHOP sports drink to a CHO sports drink during moderate intensity, steady state exercise.

METHODS: 12 healthy subjects cycled for 60min at 65%VO_2max while ingesting 300 mL of either a 6% CHO + 1.5% protein sports drink (osmolality: 441 mOsm/kg H_2O) or a 6% CHO only sports drink (osmolality: 406 mOsm/kg H_2O). Each drink contained 100 mg ^{13}C labelled-$NaC_2H_3O_2$ to serially assess gastric emptying. Beverage ingestion occurred following a 10 min warmup and 13 min of steady state exercise. $^{13}CO_2$ was then collected every 5 min for 45 min after ingestion. Venous blood glucose, HR, and RPE were collected at 15 min intervals during exercise.

RESULTS: ANOVA analysis indicated that there were no differences ($p > 0.05$) between treatments in gastric emptying, as measured by the appearance of exhaled $^{13}CO_2$ (CHOP: 14.1 +6.1; CHO: 13.7 +6.2), or in blood glucose (CHOP: 4.9 +.9 mM/L; CHO: 4.8 +.9 mM/L). Gastric emptying peaked approximately 25 min after beverage ingestion for both treatments. No differences between treatments were observed for HR (CHOP: 139 +11bpm; CHO: 138 +10 bpm) or RPE (CHOP: 13.1 +1.0; CHO: 13.2 +1.3).

CONCLUSION: Multiple studies have shown endurance and post exercise rehydration benefits of CHOP ingestion. This study demonstrates that a CHOP sports drink has similar gastric emptying characteristics during exercise to that of a CHO sports drink.

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