Gastric Emptying of Cold Beverages in Humans: Effect of Transportable Carbohydrates

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Eight healthy subjects, aged 39.0 ± 2.4 years, consumed four 6% carbohydrate-electrolyte solutions containing either one (glucose or fructose) or two transportable carbohydrates in single (glucose + fructose) or bound (sucrose) forms. Solution osmolalities ranged from 250 to 434 mOsm/kg H2O. The test solutions were ingested at rest in the amount of 6 ml/kg of body weight at a temperature of 12°C. Gastric emptying rate was measured by repeated aspirations via a nasogastric tube using the modified George double-sampling technique. The intragastric temperature was determined by a temperature probe attached to the nasogastric tube. There were no significant differences in gastric emptying rates and gastric volumes among the solutions. Intragastric temperature dropped from 36.5°C to 23.3 ± 3°C immediately after beverage ingestion but recovered to above 30°C within 5 min. These data suggest that the gastric emptying rate of the specified beverages is not affected by the number and type of carbohydrates or by solution osmolalities within the tested range. Within 5 min after ingestion, cold beverages are warmed to above 30°C in the stomach. This infers that the effect of cold solution temperature on gastric emptying rate is likely to be small and transitory.