18-3 Early effect of carbonated water administration on liquid gastric emptying: crossover study using the $^{13}$C breath test

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Background and Aims: The gastrointestinal motility effects by carbonated water have not yet been sufficiently investigated. The aim of this study was to determine whether single pre-prandial carbonated water administration might have an effect on the rate of liquid gastric emptying using the $^{13}$C-acetic acid breath test.

Methods: Eight healthy volunteers (F/M: 3/5) participated in this randomized, 3-way crossover study. The subjects fasted overnight and were randomly assigned to receive 200mL of carbonated water before ingestion of the liquid test meal (200 kcal per 200 mL, containing 100 mg $^{13}$C acetate) or 200mL of carbonated water before the test meal or the test meal alone. Under all conditions, breath samples were collected for 150 min following the meal. Liquid gastric emptying was estimated by the values of the following parameters: $T_{1/2}$, $T_{lag}$, the gastric emptying coefficient (GEC) and the regression-estimated constants ($\beta$ and $\kappa$), calculated using the $^{13}$CO$_2$ breath excretion curve using the conventional formulae. The parameters between the 3 test conditions were compared statistically.

Results: Carbonated water significantly decreased $k$ and beta, but $T_{1/2}$, $T_{lag}$ and GEC remained unchanged.

Conclusions: The present study revealed that carbonated water has dual effects on liquid emptying: an initial acceleration with a subsequent deceleration in asymptomatic volunteers.

Keywords: Carbonated water, Breath test, Gastric emptying