Effects of oral ingestion of sucralose on gut hormone response and appetite in healthy normal-weight subjects.

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Abstract

BACKGROUND/OBJECTIVE: The sweet-taste receptor (T1r2+T1r3) is expressed by enteroendocrine L-cells throughout the gastrointestinal tract. Application of sucralose (a non-calorific, non-metabolisable sweetener) to L-cells in vitro stimulates glucagon-like peptide (GLP)-1 secretion, an effect that is inhibited with co-administration of a T1r2+T1r3 inhibitor. We conducted a randomised, single-blinded, crossover study in eight healthy subjects to investigate whether oral ingestion of sucralose could stimulate L-cell-derived GLP-1 and peptide YY (PYY) release in vivo.

METHODS: Fasted subjects were studied on 4 study days in random order. Subjects consumed 50 ml of either water, sucralose (0.083% w/v), a non-sweet, glucose-polymer matched for sweetness with sucralose addition (50% w/v maltodextrin+0.083% sucralose) or a modified sham-feeding protocol (MSF=oral stimulation) of sucralose (0.083% w/v). Appetite ratings and plasma GLP-1, PYY, insulin and glucose were measured at regular time points for 120 min. At 120 min, energy intake at a buffet meal was measured.

RESULTS: Sucralose ingestion did not increase plasma GLP-1 or PYY. MSF of sucralose did not elicit a cephalic phase response for insulin or GLP-1. Maltodextrin ingestion significantly increased insulin and glucose compared with water (P<0.001). Appetite ratings and energy intake were similar for all groups.

CONCLUSIONS: At this dose, oral ingestion of sucralose does not increase plasma GLP-1 or PYY concentrations and hence, does not reduce appetite in healthy subjects. Oral stimulation with sucralose had no effect on GLP-1, insulin or appetite.

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