Pharmacological acceleration of gastric emptying decreases caloric intake and increases postprandial symptoms in obese subjects

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INTRODUCTION: Arrival of nutrients to the small intestine activates neuro-hormonal signals that play a role in the control of food intake, partly through inhibition of hunger and induction of satiety.

AIMS & METHODS: We aimed to evaluate if acute caloric intake can be decreased in overweight or obese subjects by pharmacologically accelerating gastric emptying of nutrients to the small intestine.
Satiation (ad libitum caloric intake. Kcal.) and levels of hunger, fullness and other postprandial gastrointestinal symptoms (mm on visual analog scales) were evaluated using a validated nutrient drink test. Gastric emptying (GE) during the nutrient drink test was measured using Scintigraphy. Overweight and obese subjects were tested in two different days, at baseline (Day1) and after randomly receiving, in a double blind fashion, a 1hour infusion of erythromycin (3mg/Kg, to accelerate gastric emptying) or placebo (Day 2). Acceleration of gastric emptying was assessed as the difference in % emptied from the stomach between Day 2 and Day 1 (DGE). The effects of DGE on caloric intake and symptoms were assessed using multiple (lineal) regression analyses. Initial GE (GE@15min) was the primary endpoint to assess the effect of GE on prospective caloric intake. GE@60min was the primary endpoint to assess the effect of GE on postprandial symptoms, since median time to finalize drinking was 30mins and symptoms were evaluated 30 min post-finishing drinking as in previous studies.

RESULTS: Among 30 overweight or obese subjects (24 females and 6 males), 15 received erythromycin and 15 received placebo. Overall median age was 36y (IQR: 30-42. Range: 22-56) and median BMI was 30Kg/m2 (IQR: 27-36. Range: 25-42). Subjects receiving erythromycin on Day 2 presented accelerated gastric emptying as compared to placebo ($p<0.0001$). DGE @ 15 min after initiating the meal had a significant effect on prospective caloric intake ($p=0.004$). From the best fitted regression model ($R2=81\%$, $p<0.0001$), a 10% increase in gastric emptying in the first 15 minutes induced on average a 135Kcal±43.5Kcal decrease on maximum caloric intake. Acceleration of GE @ 60 min after initiating the meal significantly increased postprandial symptoms scores measured 30min after meal was finished ($p=0.01$).

CONCLUSION: Decreased caloric intake can be induced in overweight or obese subjects by pharmacologically accelerating gastric emptying. Thus, this may be a reasonable target for pharmacological treatment of obesity.