Evaluation of gastric emptying and motility in diabetic gastroparesis with magnetic resonance imaging: effects of cisapride

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OBJECTIVE: The motor mechanisms that underlie both slow gastric emptying in diabetic gastroparesis and its acceleration by cisapride are poorly understood. We have recently shown that magnetic resonance imaging (MRI) allows concurrent evaluation of both gastric emptying and regional gastric motility.

METHODS: Emptying and motility were measured in eight diabetic patients with previously demonstrated delayed gastric emptying using a rapid MRI technique during oral administration of cisapride and placebo. Studies were performed in a double blind fashion and each patient acted as his own control. Subjects were studied supine for 120 min in a 1.5 Tesla MRI scanner after ingestion of 500 ml of 10% Intralipid. Gastric emptying corrected for the volume of secretions was determined every 15 min using transaxial scans. Each transaxial scan was followed by 120 coronal scans at 1 s intervals. Coronal scans were angled to provide simultaneous imaging of the proximal and distal stomach. MRI studies were also performed in seven diabetic patients with normal emptying who served as disease controls.

RESULTS: Emptying was slower in the gastroparetic patients (t(1/2): 124 +/- 10 min) compared to patients with normal emptying (81 +/- 9 min, p < 0.05). Cisapride accelerated gastric emptying (74 +/- 5 vs 124 +/- 10 min) in patients with gastroparesis. The contraction amplitudes in the proximal stomach of gastroparetic patients were increased during cisapride treatment (17.2% +/- 1.8% vs 13.2% +/- 0.6%; p < 0.02), whereas antral contraction frequency, amplitude, and velocity were unchanged. CONCLUSIONS: We conclude that cisapride-induced acceleration of liquid gastric emptying in diabetic gastroparesis does not appear to result from changes in antral contractility, but may be related to changes in proximal gastric tone or gastric outlet resistance.