

Gastric Myoelectrical and Emptying Activity in Patients with Gastroesophageal Reflux Disease (GERD) and Dysmotility-Like Functional Dyspepsia (GERD+): Effect of Water Load Test

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Introduction

Symptoms of dysmotility-like dyspepsia (nausea, fullness, upper abdominal distention, nausea and vomiting) are common in patients with heartburn. Approximately 60% of patients with dysmotility-like dyspepsia have gastric myoelectrical abnormalities termed gastric dysrhythmias (tachygastria, bradygastria, mixed dysrhythmia). Patients with GERD have excessive transient lower esophageal sphincter relaxations (TLESRs) which themselves may affect gastric motility. Gastric motility disorders are a risk factor for GERD and are associated with dyspepsia symptoms. These patients have GERD plus dyspepsia [GERD(+)].

Aim

To determine:

- 1) Gastric myoelectrical activity in response to the water load test during electrogastrography recordings, and
- 2) Gastric emptying in patients with GERD+ in a community based gastroenterology practice.

Methods

Patients:

- 67 consecutive patients with predominant heartburn and/or regurgitation and dyspepsia symptoms
- 41 women, 26 males (ages 19-78 years)
- Patients from community-based GI practice

Symptom Questionnaires:

GERD and Dyspepsia Symptoms

Tests:

- 1) Upper endoscopy.
- 2) Solid-phase gastric emptying study
- 3) Electrogastrogram (EGG) recording with water load test.

EGG:

Position of electrodes for recording EGGs (**Figure 1**).

- normal rhythm (2.5-3.7 cpm)
 - bradygastria (0-2.5 cpm)
 - tachygastria (3.7-10.0 cpm)
 - duodenal/respiration (10-15 cpm)
- EGG recording with water load test protocol (**Figure 2**).

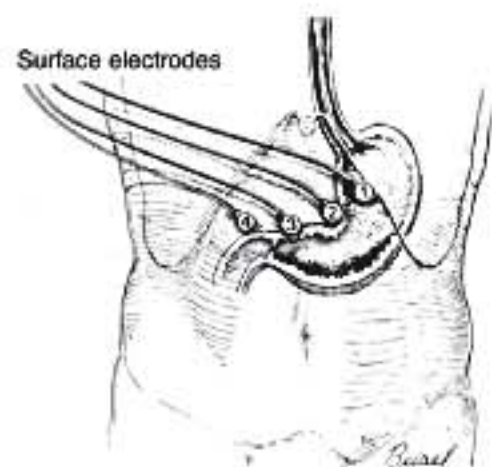


Figure 1. Position of Electrodes for Recording

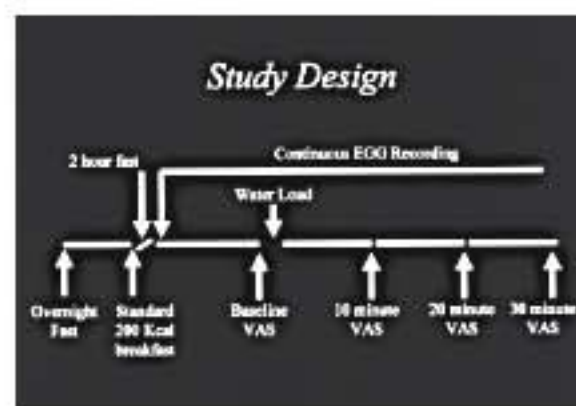


Figure 2. EGG recording with water load test protocol

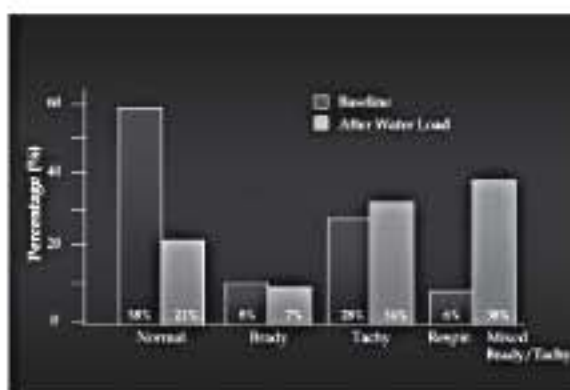


Figure 4. EGG diagnoses in GERD+ patients before and after the Water Load Test.

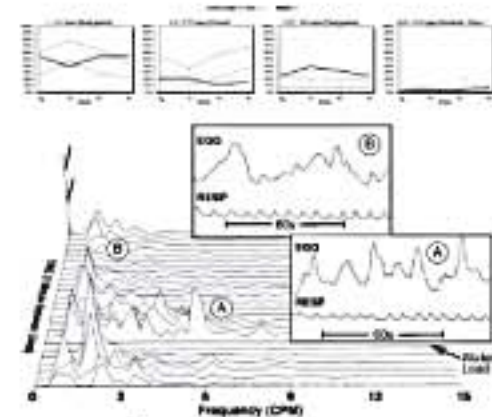


Figure 7. Mixed dysrhythmia EGG pattern in patient with GERD+.

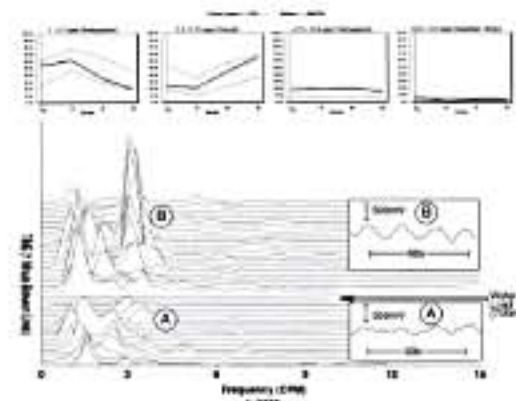


Figure 5. Normal EGG recording with Water Load Test.

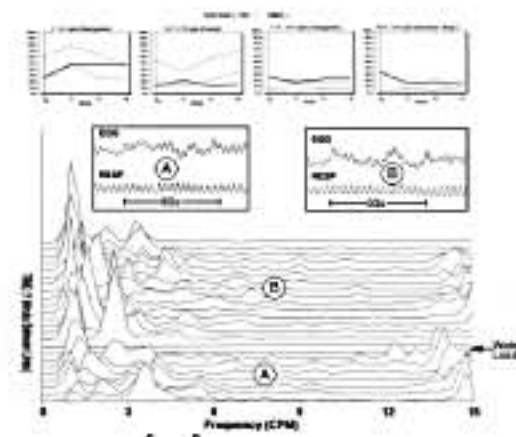


Figure 8. Mixed dysrhythmia EGG pattern in patient with GERD+.

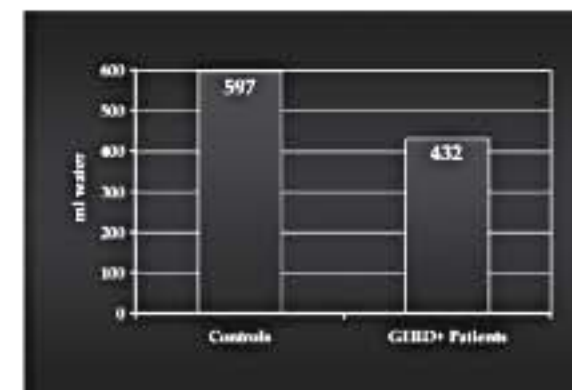


Figure 3. Average water volume ingested

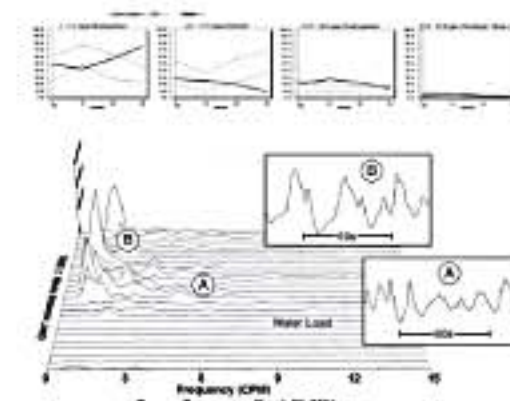


Figure 6. Bradygastria pattern in patient with GERD+.

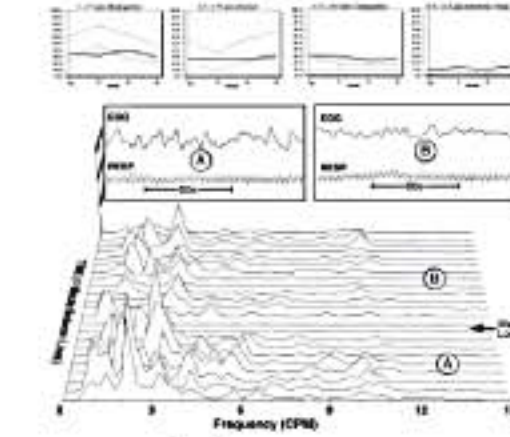


Figure 9. Tachygastria pattern in patient with GERD+.

Results:

Endoscopy Findings:

- grade 1 esophagitis was found in all patients.

Gastric Emptying Tests:

- 25% of the patients had delayed gastric emptying.

Electrogastrograms:

- Baseline EGGs were abnormal in 39% of the patients. After the water load test, 79% of the patients had gastric dysrhythmias.

Conclusions:

- 1) The EGG and provocative Water Load Test evoked a 2-fold increase in gastric dysrhythmias, predominantly a mixed gastric dysrhythmia pattern.
- 2) Gastric dysrhythmias are objective gastric neuromuscular disorders and were found in 79% of patients with GERD and dyspepsia symptoms (GERD+).
- 3) GERD+ patients have a spectrum of gastric neuromuscular dysfunction from gastric dysrhythmias to frank gastroparesis.
- 4) Relationships among GERD, gastric dysrhythmias and gastroparesis may help in understanding the pathophysiology of symptoms in patients with GERD+.