Effect of Prior Sham Feeding on Histamine-Stimulated Gastric Acid Secretion in Normal Subjects

ST PLUMBER, P ABRAHAM, S PATKAR, N K DESAI, S K MATHUR, S R NAIK

Departments of Gastroenterology, Pharmacology and Surgery, Seth G S Medical College and K E M Hospital, Parel, Bombay 400 012

Abstract

The effect of prior modified sham feeding (MSF) on histamine-stimulated gastric acid secretion was evaluated in six normal male volunteers by comparing the results in (a) a single session test sequentially collecting basal, MSF-stimulated and histamine-stimulated acid secretion, and (b) a conventional test collecting basal followed by histamine-stimulated acid secretion. The mean ± SEM peak acid output following histamine stimulation in the two tests were 15.5 ± 3.5 and 15.4 ± 1.7 mmol/l (t = 0.177; p > 0.1). Since MSF did not alter the acid response to the subsequent histamine stimulation, the two tests, one representing the cephalic-vagal phase of acid secretion and the other the maximal parietal cell response, may be more simply performed in one session to reduce inconvenience to the patient.

Key words: Gastric acid, modified sham feeding, histamine, single session test.

Introduction

Modified sham feeding (MSF) has gained acceptance as a physiologic method of assessing the cephalic-vagal phase of gastric acid secretion.1 The method has been recently evaluated by us in Indian subjects.2 Stimulation with histamine or its analogue or penta-gastrin, on the other hand, induces maximal parietal cell response. The two tests are useful in physiological studies and in post-vagotomy assessment of gastric secretion in patients with peptic ulcer disease.3

The present study was undertaken to determine if the two tests can be performed in one session without interference or if they should be performed in separate sessions to avoid interference in the results of maximal stimulation by a prior sham feeding stimulus.

Material and Methods

The technique for MSF (chew and spit) has been described earlier.4 Briefly, with an 18 Fr nasogastric tube positioned in the antrum, after collection of basal output for 30 min, the subject chews and spits vegetable sandwiches for 15 min, taking care not to swallow. Gastric secretion is collected by continuous slow suction during these 15 min and continued for 45 min more. For histamine stimulation, phentolamine maleate (45-5 mg intramuscular) is followed 30 min later by histamine acid phosphate (60 μg/kg subcutaneous). Gastric secretion is collected for 60 min following histamine injection.

In both cases, the pH is determined in vitro in 15 min aliquots using a glass electrode. Acid output is calculated in each aliquot as a product of concentration (derived from pH using a nomogram described earlier) and confirmed in our laboratory) and volume. The peak output was obtained by doubling the sum of the highest two consecutive 15 min values.

The influence of MSF on the response to subsequent histamine stimulation was determined as follows: After an overnight fast, on Day 1, basal acid output (BAO) was collected for 30 min, followed in succession by acid output in response to MSF (60 min), antihistaminic (30 min) and histamine (60 min). On Day 2 (performed 48 h later), BAO was followed by antihistaminic and histamine. Mean peak acid output (PhAO) following histamine stimulation on Days 1 and 2 were compared, using Student's t test for paired observations to determine statistical significance.

Results

The 15 min acid response patterns on Days 1 and 2 are shown in the Figure. On Day 1, acid levels which rose following MSF invariably returned to basal values during the 30 min following antihistaminic injection.

Fig: The 15 min acid response patterns on Days 1 and 2. Following antihistaminic (not shown in graph) before histamine injection, values returned to basal levels. The break between basal and post histamine values on Day 2 in the graph is shown to facilitate comparison between corresponding values on the two days.

*1986 by the Indian Society of Gastroenterology.
The mean ± SEM PhAO on Days 1 and 2 were 15.5 ± 3.3 and 15.1 ± 1.7 mmol/l, respectively (t = 0.177; p > 0.01).

Discussion

We have demonstrated that prior modified sham feeding does not influence the response of gastric acid secretion to histamine stimulation performed at the same session in normal individuals. The two tests, one representing the cephalic-vagal phase of acid secretion and the other the maximal parietal cell response, may therefore be undertaken consecutively to reduce the inconvenience inherent in the two-day protocol. The phenomenon of fatigue observed following repeated stimulation of parietal cells was not seen or expected in our study because the period of study was brief and the stimulus we used initially (MSF) provokes a response well below the maximal or near-maximal levels necessary to induce fatigue.

An earlier study using MSF and pentagastrin stimulation also concluded that the two tests could be performed consecutively without interference in duodenal ulcer patients. In that study, however, the process of chew-and-spit was continued for 30 min as opposed to 15 min in our study, and acid was collected for a total of 120 min as compared to 60 min by us. By the end of the 2 h period in that study, acid secretion returned to basal levels. In our study also, acid levels invariably returned to basal values prior to histamine injection, during the 30 min following administration of the antihistamine. In 60 min of MSF stimulation, the possibility of interference in such a study should be evaluated.

In conclusion MSF and histamine stimulation studies can be performed in one session without interference. Pre and post operative assessment of cephalic-vagal phase as a fraction of maximal parietal cell secretion in patients with duodenal ulcer undergoing vagotomy may be found easier with a single session test.

References


Albendazole: A New Broad Spectrum Anthelmintic for Treatment of Intestinal Helminthisis

S L B ROOR, S S BASSI, S BROOR

Departments of Internal Medicine and Gastroenterology, Postgraduate Institute of Medical Education and Research, Chandigarh 160012

Abstract

The anthelmintic activity of a recently introduced drug, albendazole, was tested in 55 patients with single or mixed infections caused by hookworms, roundworms, whipworms, threadworms and tapeworms. Besides the stool examination by direct smear and concentration method, fecal egg counting was done using the Kato technique. After a single dose of 400 mg of albendazole, the cure rate was 93.75% (30/32) in ancylostomiasis.