

Gastric emptying rates in idiopathic dyspepsia with and without "hunger pain"

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SUMMARY

It has been previously observed that in dyspeptic patients with "hunger pain", that is, with pain suggestive of the presence of peptic ulcer, only 12% had an endoscopically demonstrated ulcer, the remaining 88% showing absence of important macroscopically detectable lesions (idiopathic dyspepsia). In order to investigate the possibility of a relationship between "hunger pain" and some alteration in gastroduodenal motility, the gastric emptying rates of patients presenting idiopathic dyspepsia with and without "hunger pain" were compared with those of normal control subjects.

The study was conducted in 40 patients presenting idiopathic dyspepsia, 20 with and 20 without "hunger pain", and 30 voluntary apparently normal control subjects. The patients and the controls ingested, with a standard breakfast, a gelatine capsule containing 10 radioopaque polyurethane markers, and the gastric emptying of the markers was evaluated taking 3 x-ray films of the abdomen at 1.5, 3.0 and 4.5 hours after the breakfast.

The gastric emptying rates of the markers were significantly higher in the patients with "hunger pain", and significantly lower in the patients without "hunger pain", than in the normal control subjects.

In idiopathic dyspepsia with and without "hunger pain" there are, respectively, abnormally increased and abnormally decreased gastric emptying rates of undigestible solid markers. Our findings could help to better understand the pathogenesis of those different types of dyspepsia and, consequently, to improve their treatment.

Index: Idiopathic dyspepsia, "hunger pain", gastric emptying.

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INTRODUCTION

On 1989, León-Barúa et al. (1) observed that in dyspeptic patients with "hunger pain", that is, with pain suggestive of the presence of peptic ulcer, only 12% had an endoscopically demonstrated ulcer, the remaining 88% showing absence of important macroscopically detectable lesions (idiopathic dyspepsia).

Even though the acidity and volume of gastric secretion are considered the main determinant factors of "hunger pain", for a long time an alteration in gastroduodenal motility has been proposed as another factor in its origin (2).

In order to investigate the relationship between "hunger pain" and altered gastroduodenal motility, the present study was designed to compare the gastric emptying rates of patients presenting idiopathic dyspepsia with and without "hunger pain" and of normal control subjects, using radioopaque undigestible solid markers (3).

MATERIAL AND METHODS

The study was conducted in 40 patients presenting endoscopically-negative dyspepsia of more than one month duration, 20 with and 20 without "hunger pain". We define dyspepsia as a symptom or group of symptoms (syndrome) that seem to generate directly in the upper gastrointestinal tract and to relate to the presence or absence of food in the stomach and/or duodenum. "Hunger pain" has been previously defined as continuous pain of a burning or gnawing quality, that presents in the epigastrium or any other location of the upper abdominal region, appears more than one hour after meals, is alleviated by intake of food or antacids, may awake the patients during the night, and occurs periodically through time (1).

The 20 patients with "hunger pain", 13 female and 7 male, were 17 to 63-year-old with a mean age of 35 years; and the 20 patients without "hunger pain", 13 female and 7 male, were 19 to 74-year-old with a mean age of 41 years. The frequency of dyspeptic symptoms in the two groups of patients appear in detail in table I. Thirty apparently normal control subjects were also studied, 15 female and 15 male, their ages being from 17 to 67 years with a mean of 28 years.

The study was approved by the Cayetano Heredia Peruvian University Institutional Review Board, and all the patients and controls signed an informed consent to participate in the study.

The patients had not received any medication for at least one week before the study. In all of them,

fiberpanendoscopy was performed to rule out ulcerated and elevated lesions.

After an overnight fast, the patients and the controls ingested: 1) A gelatine capsule containing 10 radioopaque markers made of polyurethane impregnated with barium sulfate at a concentration of 40% (3); and 2) A breakfast consisting of oats porridge (oats 10 g, sugar 20 g, and water 300 ml), cottage cheese (14 g), a cake (40 g) and orange juice (200 ml). The breakfast supplied 422 Kcal (proteins 8 g, fats 10 g, and carbohydrates 75 g).

Gastric emptying of the markers was evaluated taking 3 x-ray films of the abdomen, with the individuals in dorsal decubitus, at 1.5, 3.0 and 4.5 hours after the breakfast, and counting the number of markers that had left the stomach in each of those periods of time. Confident localization of the markers to the stomach was possible, in most of the individuals, taking into account the distention of the stomach by gas, the soft tissue outline of the stomach along its contour, and the known position of the stomach and duodenum (3).

The mean numbers and percentages of markers having left the stomach at 1.5, 3.0 and 4.5 hours after the breakfast in the two groups of dyspeptic patients and the group of control subjects were compared statistically.

RESULTS

Gastric emptying rates of the markers were significantly higher in the patients presenting idiopathic dyspepsia with "hunger pain", and significantly lower in the patients presenting idiopathic dyspepsia without "hunger pain", than in the normal control subjects. This was specially true when the results at 3.0 hours after ingestion of the markers were considered (Table II).

Figures 1 and 2 show, respectively, the position of the markers at 1.5 and 3.0 hours after their ingestion in a patient who presented dyspepsia with "hunger pain".

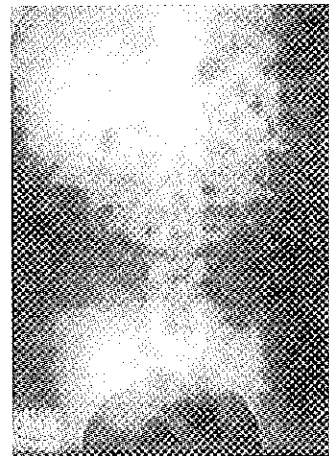
Table I: Symptomatology of the patients presenting idiopathic dyspepsia with and without "hunger pain"

| | Frequency (%) of dyspeptic symptoms in the patients | |
|--|---|-----------------------|
| | With "hunger pain" | Without "hunger pain" |
| "Hunger pain" | 100.0 | 0.0 |
| Postprandial epigastric fullness sensation | 50.0 | 60.0 |
| Heartburn, regurgitations | 70.0 | 70.0 |
| Nausea, vomiting | 30.0 | 45.0 |
| Postprandial epigastric pain | 0.0 | 70.0 |
| Excessive belching | 40.0 | 30.0 |
| Meteorism | 55.0 | 65.0 |

Table II: Gastric emptying of undigestible solid markers in patients presenting idiopathic dyspepsia with and without "hunger pain" and control subjects

| | 1.5 h | Times 3.0 h | 4.5 h |
|--|--------------------------------------|-----------------|-----------------|
| | Number of markers out of the stomach | | |
| | Mean (%) ± S.D. | Mean (%) ± S.D. | Mean (%) ± S.D. |
| Dyspeptic patients with "hunger pain" (N= 20) | 3.9 (39) ± 4.7 | 8.1 (81) ± 3.2 | 10 (100) ± 0.0 |
| Control subjects (N= 30) | 0.9 (90) ± 2.5 | 4.8 (48) ± 3.8 | 9.7 (97) ± 1.1 |
| Dyspeptic patients without "hunger pain" (N= 20) | 0.0 (0) ± 0 | 1.7 (17) ± 2.7 | 7.7 (77) ± 3.9 |
| | p=0.024 | p=0.006 | p=0.149 |
| | p=0.035 | p=0.01 | p=0.04 |

Gastric evacuation of markers at 1.5 hours (figure 1) and 3.0 hours (figure 2) in one of the patients who presented dyspepsia with "hunger pain".



DISCUSSION

With the use of radioopaque undigestible solid markers we have observed, in the present study, a highly significant difference in gastric emptying rates of the markers between normal control subjects and patients presenting idiopathic dyspepsia with and without "hunger pain". As has been well demonstrated, the gastric evacuation of undigestible solids depends on the migratory motor complex (MMC) (4,5), a set of contractions of the gastric antrum and upper small bowel that occurs during the interdigestive period and is responsible for the cleansing of those regions of the gastrointestinal tract (5). In dyspepsia with "hunger pain" there would then be hyperactivity of the MMC; and in dyspepsia without "hunger pain", hypoactivity. The idiopathic dyspepsia types we denominate as with and without "hunger pain" remind, respectively, the clas-

sically described "hypersthenic" and "hyposthenic" constitutions (6).

It would probably be important to understand why patients presenting idiopathic dyspepsia with "hunger pain" seem to respond well to the use of acid-suppressant therapy with H₂-blockers (León-Barúa R, Berendson-Seminario R, Biber-Poillevard M. Unpublished observations). A reasonable answer could be that gastric acid plays a permissive role for the induction of MMC hyperactivity in predisposed individuals. In fact, the hormone motilin has been implicated in the stimulation of the MMC (7), and gastric acid arriving to the duodenum is known to liberate motilin (7,8). This would explain the favorable effect of drugs that reduce or suppress gastric acid on the course of dyspepsia with "hunger pain" even in the absence of peptic ulcer. Regarding patients who present idiopathic dyspepsia without "hunger pain", our clinical experience is that, as expected, they respond very well with the use of prokinetic drugs.

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Resumen

Previamente se ha observado en pacientes dispépticos con "dolor de hambre", es decir, con dolor sugestivo de presencia de úlcera péptica, que sólo el 12 % tiene úlcera demostrable endoscópicamente, mientras que en el 88 % restante no se encuentran lesiones detectables macroscópicamente (dispepsia idiopática). Para investigar la posibilidad de relación entre "dolor de hambre" y alguna alteración en la motilidad gastroduodenal, se compararon velocidades de evacuación gástrica en pacientes con dispepsia idiopática sin y con "dolor de hambre" y en sujetos controles normales.

Se llevó a cabo el estudio en 40 pacientes que presentaban dispepsia idiopática, 20 con y sin "dolor de hambre" y en 30 sujetos voluntarios aparentemente sanos. Los pacientes y los sujetos controles ingirieron, con un desayuno standard, una cápsula de gelatina conteniendo 10 marcadores de poliuretano radioopaco, y se evaluaron las velocidades de evacuación gástrica de los marcadores tomando 3 radiografías del abdomen a las 1.5, 3.0 y 4.5 hs después del desayuno.

Las velocidades de evacuación gástrica de los marcadores fueron significativamente más altas en los pacientes con "dolor de hambre" y significativamente más bajas en los pacientes sin "dolor de hambre", que en los sujetos controles normales.

En la dispepsia idiopática con y sin "dolor de hambre", hay respectivamente, velocidades de evacuación gástrica de marcadores sólidos no digeribles anormalmente incrementadas y disminuídas.

Nuestros hallazgos podrían ayudar a comprender mejor la patogenia de estos diferentes tipos de dispepsia y consecuentemente, a mejorar su tratamiento.

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