CLINICAL RESEARCH

Oesophageal motility in the irritable bowel syndrome

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Abstract

Oesophageal motility was assessed in 30 patients with the irritable bowel syndrome and controls matched for age and sex. Lower oesophageal sphincter pressure was significantly lower in the patients than their controls (mean pressures 13.8 and 23.8 cm H₂O respectively), and the same degree of difference between patients and controls was maintained in all age groups. In addition, spontaneous activity, repetitive contractions, and the presence of variable-amplitude and simultaneous waves were significantly more common in the patients, who were also more likely to have more than one abnormal pattern of motility. There was no difference in upper oesophageal sphincter pressure between the two groups.

These findings may help to explain why patients with the irritable bowel syndrome may complain of upper gastrointestinal symptoms, including heartburn and dysphagia. The results suggest that the syndrome may be a more widespread disorder of smooth muscle, or its innervation, than was previously thought.

Introduction

The irritable bowel syndrome defines a symptom complex usually consisting of a combination of diarrhoea, constipation, abdominal pain, and other large-bowel symptoms.¹ A barium enema may show hypersegmentation, and motility studies of the colon often show abnormalities.²⁻⁵ A recent study showed that small-intestinal pressure was also disturbed, suggesting that the disorder may not be confined to the colon.⁶ In addition, patients with the syndrome often complain of upper gastrointestinal symptoms. Since the irritable bowel syndrome may therefore be a more diffuse disorder than was previously supposed and oesophageal motility has not been assessed in this condition, we

performed oesophageal manometry in patients with the syndrome and matched controls.

Patients and methods

We studied 30 patients with the irritable bowel syndrome (17 women, 13 men; mean age 39 years) and 30 age- and sex-matched healthy controls selected from hospital staff. Patients were considered to have the irritable bowel syndrome if they had abdominal pain with or without diarrhoea or constipation. Relief of pain by defecation, abdominal distension, a feeling of incomplete evacuation, and a response to a high-residue diet were taken as useful additional symptoms. The blood picture, erythrocyte sedimentation rate, and results of sigmoidoscopy, rectal biopsy, and barium enema were normal in all patients. The symptoms of the patients, including dysphagia and heartburn, were recorded on data sheets for correlation with manometric findings.

Oesophageal manometry was performed on fasting subjects, the patients' medication having been stopped 48 hours previously. Measurements were made using a 125 cm long, triple (1.1 mm) lumen tube with distal openings separated 5 cm vertically and spaced radially at 120°. Each lumen was perfused with distilled water at 1.36 ml/min using a capillary infusion system⁷ (Arndorfer Medical Specialties) with Elcomatic pressure transducers connected to a Devices Multichannel pen recorder. The lower oesophageal sphincter pressure was measured using both the station⁸ and the rapid pull-through techniques.⁹ End expiratory pressures, with the gastric baseline as zero reference, were used for measurements obtained by the station method.

In the lower portion of the body of the oesophagus the tube was left in the same position for five minutes. The number of spontaneous waves not induced by swallowing was recorded and expressed as number per minute. One or more waves per minute were regarded as spontaneous activity. For the rest of the examination the tube was withdrawn at 2 cm intervals with wet (5 ml water) and dry swallows at each level. The presence of simultaneous and incompletely propagated waves was recorded. Variable-amplitude waves (fluctuating outside a normal range of 40-110 cm H₂O) and repetitive waves (a contractile response with more than one peak of pressure after a single swallow) were also noted. The upper oesophageal sphincter pressure was recorded by the station method. All tracings were analysed blind after they had been coded.

Results

The figure shows the lower oesophageal sphincter pressures in the patients and controls as determined by the station method. The sphincter pressure was significantly lower in the patients than the

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controls ($p < 0.001$, paired t test). Table I shows the mean sphincter pressure as determined by the station method in different age groups; the same degree of difference between patients and controls was maintained in all age groups. A close correlation was found between results obtained by the station and rapid pull-through techniques ($r = 0.71$, $p < 0.001$).

Table II shows the incidence of various patterns of activity recorded in the oesophageal body. The patients had significantly more spontaneous activity, repetitive contractions, and variable-amplitude and simultaneous waves. In addition, they were more likely to have more than one abnormal pattern of motility. No particular manometric abnormality correlated with any pattern of symptoms of the irritable bowel syndrome. There was no difference in the upper oesophageal sphincter pressures between the two groups.

TABLE I—Comparison of mean ($\pm$ SD) lower oesophageal sphincter pressures (cm H_2O) in patients with irritable bowel syndrome and controls according to age

Age (years)	Controls	Patients
20–35 (n = 14)	25.2 $\pm$ 1.8	16.95 $\pm$ 2.4
36–50 (n = 9)	25.2 $\pm$ 1.8	13.4 $\pm$ 2.1
> 50 (n = 7)	19.26 $\pm$ 1.59	12.4 $\pm$ 3.3

TABLE II—Comparison of incidence of manometric findings in body of oesophagus in patients with irritable bowel syndrome and matched controls. Figures are numbers (%) of subjects

	Spontaneous activity	Variable-amplitude waves	Simultaneous waves	Repetitive contractions	Incomplete waves
Patients (n = 30)	16 (53.3)	13 (43.3)	15 (50.0)	13 (43.3)	9 (30.0)
Controls (n = 30)	8 (26.7)	4 (13.3)	4 (13.3)	5 (16.7)	7 (23.3)
Significance*	$p = 0.05$	$p = 0.02$	$p = 0.01$	$p = 0.05$	NS

*Significance determined by χ^2 test.

Eight patients with the irritable bowel syndrome complained of dysphagia but upper endoscopic examination showed no abnormality; all of these subjects had some degree of manometric abnormality.

Discussion

This study clearly shows that, compared with matched controls, patients with the irritable bowel syndrome have a significantly reduced lower oesophageal sphincter pressure. Motility patterns within the oesophageal body also differed

significantly from those in the controls. These findings suggest that the irritable bowel syndrome may be a more diffuse disorder than was originally thought.

Oesophageal symptoms are increased in patients with the irritable bowel syndrome,¹⁰ and possibly our results help to explain this observation. Interestingly, all of our patients who complained of dysphagia had some degree of abnormal oesophageal motility. Lower oesophageal sphincter pressure is inclined to decrease with age, and this was confirmed when the subjects were grouped according to age (table I). Nevertheless, the same significant differences between patients and controls were maintained irrespective of age group.

The abnormal findings in this study were confined to the smooth-muscle portion of the oesophagus, no abnormalities being found in the striated upper oesophageal sphincter. Abnormal colonic^{2–5} and, more recently, small-intestinal⁶ motility has been shown in patients with the irritable bowel syndrome. The colonic hypermotility may be exacerbated by food or cholinergic stimulation, and gut hormones may possibly play a part. Cholecystokinin increases intestinal motor activity and reproduces symptoms^{11,12} in some patients with the irritable bowel syndrome, and in the light of our findings it is noteworthy that cholecystokinin decreases the lower oesophageal sphincter pressure.¹³

Our results suggest that the irritable bowel syndrome may be a more widespread disorder of smooth muscle, or its innervation, than has been previously recognised.

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