Inhibition of Postprandial Colonic Motility by Sulpiride in Patients with Irritable Colon

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Summary. Sulpiride, a benzamide derivative, selectively antagonizes dopaminergic receptors within and outside the central nervous system. Dopamine has previously been shown to increase colonic motility. In the present investigation the motor response of the pelvic colon to a standard 1000 calorie meal was studied in 12 patients with the irritable bowel syndrome. The meal induced a significant increase in motor activity, lasting for 1 h and greatest in the first 30 min. In 6 cases the administration of sulpiride 100 mg i.m. significantly reduced the postprandial increase in colonic motor activity. Thus dopaminergic receptors may be involved in the colonic motor response to food.

Key words: sulpiride, gastrocolic reflex; dopaminergic receptors, irritable bowel syndrome

The presence of specific dopaminergic receptors in the gastrointestinal tract, with contrasting actions on different regions, has been clearly shown. The administration of dopamine has an inhibitory motor effect on the human stomach and on the oesophagus in the opossum [15, 17], an excitatory action on the duodenum in vitro [1] and on the human colon [14], and it reduces gastric and pancreatic secretion in man [25].

Sulpiride is a benzamide derivative, widely used in Europe as an antipsychotic, antidepressant and antiemetic, especially in the treatment of somatic complaints in neurotic patients [21]. Sulpiride has been successfully employed even in the treatment of patients with gastrointestinal disease [6, 13, 16], but it is not clear there whether its beneficial effects are the result of a central or a peripheral action. Like other typical neuroleptics, Sulpiride antagonizes dopamine receptors in the central nervous system and outside the brain, with enhancement of gastric motility [22], inhibition of gastric secretion [2, 12] and stimulation of pancreatic secretion [9]. Finally, recent reports have shown that Sulpiride suppresses or strongly reduces distal colonic motility in most subjects (83%), particularly if the preexisting basal activity is high [16].

Patients with irritable bowel syndrome frequently complain of postprandial abdominal pain and bloating, which appear to be related to an increase in colonic motility [5, 23]. The aim of the present study was to investigate the effect of Sulpiride on the motor activity of the sigmoid colon in response to food in patients with irritable bowel syndrome.

Material and Methods

Colonic motility was studied in 12 patients with irritable bowel syndrome, who complained of diarrhoea, constipation or a combination of them and abdominal pain. The diagnosis was made on the basis of sigmoidoscopic examination, barium enema and an upper gastrointestinal radiographic study, with negative stool examination for bacteria or parasites and no evidence of lactose intolerance.

Distal colonic motility was measured with a probe carrying 2 air-filled balloons (2.5 x 1 cm) mounted 10 cm apart. The balloons were positioned through a sigmoidoscope, the proximal one usually lying 25 cm from the anal verge. The pressures were recorded using Statham transducers (model P 231 a) connected to a recorder (O.T.E Instruments, Firenze). Respiration were monitored by a pneumograph belt placed around the chest and connected to a transducer. The patient fasted for at least 12 h before the examination and received a 200 ml tap water enema 3 h before sigmoidoscopy. Intraluminal pressure recordings were commenced 45 min after removal of the sigmoidoscope. After a 30 min basal period, the subject was fed a standard hospital meal of 1000 calories (fat 460 cal, protein 310 cal, carbohydrates 320 cal).
Fig. 1. Colonic motor activity during fasting and after a standard meal: (a) previous administration of placebo (12 cases); (b) previous administration of Sulpiride (6 cases). Statistical comparison is made between the mean of all the M.I. values arising from the fasting period and the mean of each of the 10 min periods after the meal.

Fig. 2. Colonic motor activity for each 30 min period during fasting and after a standard meal with either Sulpiride or Placebo. In the figure is reported (*) the significant difference between the postprandial periods (placebo against sulpiride). Sulpiride administration significantly reduced the increase in activity induced by eating in both periods.

The meal consisted of spaghetti with butter and tomato sauce, beefsteak and cheese.

Intraluminal pressure was recorded for a further 60 min.

All 12 patients examined were asked to repeat the test at a later date and 6 of them agreed to do so. In these 6 subjects, chosen at random, either Sulpiride 100 mg or a saline placebo was administered i.m. 5 min before eating, the other injection being given on the second occasion. In addition, the 6 patients who only took part in one study received saline placebo i.m. before the meal.

Intraluminal pressure variation recorded by the 2 microballoons was evaluated by calculating the motility index (M.I.) by multiplying the mean amplitude of the pressure waves by the percentage duration of the motor activity. The final M.I. considered is the sum of the M.I. calculated for the two microballoons.

As the experiments were performed on the same patients (the Sulpiride test being done on different days), statistical analysis employed the paired Student's t-test. All results are expressed as mean ± SEM. The physician (L.M.) who evaluated the pressure variations was unaware of the type of experiment performed.

Results

The investigations performed in 12 patients showed that during fasting, the distal colonic intraluminal pressure was constant; in 3 consecutive 10 min periods the mean M.I. was, respectively, 443 ± 134.9; 463 ± 139; 572 ± 336 (Fig. 1a). The response to a standard meal was characterized by an immediate and abrupt increase in contractile activity (M.I. 1699 ± 507.7 at 10 min), reaching its peak after 20 min (M.I. 2707 ± 952.8). Motor activity then