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Irritable Bowel: A Food Allergy?

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The irritable bowel is a syndrome characterized by a variety of symptoms. They range from dysuria to chest pain. However, the principal complaints of patients with irritable bowel syndrome (IBS) are: nonulcer dyspepsia, abdominal distension and pain, constipation and/or diarrhea. Almost all patients with IBS have minor or major psychiatric disorders.

The IBS is estimated to affect up to one quarter of the population of Western countries [1]. A third, if not half of patients with IBS might be in the diarrhea predominant category. IBS is frequent but fluctuating in the general population. According to various definitions the prevalence of IBS varies from 5 to 65% and the incidence varies from 1 to 36% [2]. Recent studies of IBS prevalence in a random population have reported that colonic symptoms are very common in the general population [2]. It still needs to be verified whether the syndrome is a disease entity or just an acceptable life condition.

There is a good evidence that IBS is a disorder of intestinal motility. Several causes have been hypothesized as responsible for the syndrome. Their importance is related to the specific interest of the authors. Gastroenterologists and physiologists underline the importance of dysmotility due to intestinal hormones and peptides, while psychiatrists and psychologists think about psychoneurotic behavior and emotional stress. From the 1982 paper of Alun-Jones et al. [3], allergists believe that IBS is due to food intolerance-allergy. Since then, hundreds of papers on IBS have been published, but only few dealing with food allergy-intolerance and IBS. Furthermore, a recent review in the *New England Journal of Medicine* [4] did not mention food allergy as a cause of the syndrome.

In a letter published in the *New England Journal of Medicine* in 1994, Brostoff [5] affirms that 'literature now supports the concept that an elimination diet relieves the symptoms of the disease in approximately 50% of patients'. He quoted a number of works that confirmed his statement.

First of all we should better define what it is meant by food allergy and food intolerance. Food allergy is a reaction to food due to a known and documented immunological mechanism. Food intolerance is a reaction to food due to: a supposed but not demonstrated immunological mechanism; enzymatic deficiencies or pharmacological properties of the food. However, the kind of foods can influence the colonic motility; for example, fat induces a rapid increase in colonic motility. Excessive fermentation of wheat starch and other sugars such as sorbitol, fructose, raffinose may also be a cause of symptoms. It is likely that people suffering from IBS can abnormally react to normal properties of the food. Intestinal distension because of food fermentation can trigger, by stretching the muscles, muscular contractions and then symptoms, even though the same amount of gas does not provoke symptoms in other subjects. This is in keeping with the fact that in IBS there is no increased production of H_2 , the amount of gas does not differ from that of normal people and the patients have altered visceral sensation.

In 1994, Francis and Whorwell [6] showed that all symptoms of IBS were exacerbated by bran with bowel disturbances most often adversely affected. They also suggested that the excessive consumption of bran in the community may be creating patients with IBS by exacerbating mild noncomplaining cases. When associated with meals, pain is usually related to the act of eating or the amount of food. Disturbances in gastrointestinal function may result from disordered eating and may lead to increase in gastrointestinal symptoms. Obese binge eaters reported more gastrointestinal symptoms than normal weight controls. Obesity was associated with more frequent constipation, diarrhea, straining and flatus. There is a significant association between obesity, binge eating and symptoms of IBS [7]. Recent evidence suggests that some of the symptoms associated with functional bowel disorders may result from excessive air swallowing. Under normal condition 2–5 ml of air is ingested with each swallow. Therefore, gastrointestinal symptoms associated with excess bowel gas may result from excessive air intake during food ingestion or from more chronic behavioral changes associated with prolonged aberrant eating patterns. Some food can provoke symptoms because of its metabolic and pharmacological actions. Symptoms of hypolactasia are often mistaken for those of IBS. Lactose maldigestion causes uncharacteristic abdominal symptoms such as bloating, borborygmus, colonic flatulence and diarrhea. The symptoms of IBS and lactose maldigestion are similar. A deficit of disaccharidases may be a contributory factor for patients with IBS. Patients with IBS, who frequently have minor or major psychiatric

symptoms, often wrongly believe that a specific food or group of foods provoke their symptoms and they have a temporary improvement of symptoms when they stop eating those foods.

In November 1982, Alun-Jones et al. [3] published in the *Lancet* a paper on food intolerance. They thought of the possibility of food intolerance as a major factor in the pathogenesis of IBS because bran occasionally caused patients to complain of more severe symptoms. In 1994, Francis and Whorwell [6] showed that all symptoms of IBS were exacerbated by bran, which means that diet by itself may provoke alteration of, or influence, the gastrointestinal motility. The Alun-Jones' patients went on a 1-week diet with a single meat, a single fruit and distilled or spring water. Taking into account the personality of patients with IBS, a week of this too restricted diet can, on the one hand, provoke symptoms in some patients (even if they were really food intolerant); on the other hand, the small amount of food can influence the manifestation of symptoms. Fourteen of the 21 patients studied by Alun-Jones were found to be 'intolerant' to specific foods. The foods were wheat, corn, dairy products, coffee, tea and citrus fruits. They are foods that usually provoke some gastrointestinal symptoms (even without the intensity seen in IBS). Everybody knows the effect of coffee and tea on intestinal motility and dyspepsia due to citrus fruits.

Alun-Jones et al. [3] used the increase of prostaglandins (PGE_2) in the feces of 5 IBS patients with diarrhea to back up the hypothesis of (specific) food intolerance. The increase of PGE_2 could be nonspecific. In the intestine, peptide-containing neurons make a net of interconnections and influence each other. The authors did not test other peptides. Several peptides can have the same action on gastrointestinal motility. The presence of other peptides in the feces of patients with diarrhea could have made the presence of PGE_2 less specific and (then) could have lowered the role of the prostaglandin as a mediator of food intolerance. If only a smell of food can influence the interdigestive pattern of the intestinal motility, what can be the influence of eating it? Finally, Alun-Jones does not give any proof of food allergy.

In 1983, Bentley et al. [8] studied 27 patients. Nineteen complained with dietary manipulation. Food hypersensitivity as a cause of abdominal symptoms was confirmed by double-blind food provocation in only 3 patients who also had evidence of associated atopic disease and positive skin test to common inhalant allergens. In the introduction of their paper they affirm that it is also evident that some patients do not tolerate foods because of psychological rather than organic factors. Of the 3 atopic patients, 2 were intolerant to milk. Bentley tells that they were not lactose intolerant, but he does not explain how he ruled out a deficit of disaccharidases. Furthermore, they had skin prick tests negative to milk. The third patient reacted to yeast. It is not clear why this last patient had negative skin prick test at the presentation and positive when she went on exclusion diet. It is

likely that the chronic symptoms she was complaining of were due to other causes of IBS. The result that 8 patients with IBS were atopic and that only 3 had 'food hypersensitivity' casts doubts on a relationship between atopy and IBS, which is in keeping with other authors' works [9]. The association of gastrointestinal symptoms with asthma and hay fever does not mean that IBS is related to hypersensitivity. It does mean that food allergy can also be responsible for gastrointestinal symptoms as in oral allergy syndrome. It is difficult to generalize a result when there is positive skin prick test only on one occasion. Bentley does not think that the negative skin tests in the 2 milk-intolerant patients necessarily exclude the involvement of IgE in the pathogenesis of the gut lesion. We might think about a local hypersensitivity reaction, but Bentley does not give any demonstration of local anaphylaxis [10].

In 1992, Stefanini et al. [11] published a paper on the effect of disodium cromoglycate (DSCG) on IBS and they claimed a protective role of DSCG in food-dependent diarrheic-type IBS. In order to support the hypothesis of food hypersensitivity in IBS, they used as referring points the works of Alun-Jones et al. [3] and Bentley et al. [8]. Stefanini et al. [11] did only open challenges. They selected patients with a long history of diarrhea. These patients are known to have more psychological problems. Seventy-four patients had positive skin prick tests to at least one alimentary allergen. When you notice the foods to which patients claimed to be intolerant, they are foods that people do not eat every day. It is difficult to incriminate them as responsible for the chronic symptomatology of IBS even taking into account the variability of the symptoms of the syndrome. Foods such as milk, cereals and beans can be themselves responsible for symptoms without any allergic mechanism. Sixty percent of their patients improved with DSCG. Thirteen of the patients with skin prick tests positive to food did not have improvement (they speak of improvement and not of recovery from symptoms as would be expected!). In IBS, 35% of patients improve on placebo. A high level of suggestibility could explain the high placebo response rate.

Gasbarrini's group quotes the results of two works published in the *American Journal of Physiology* by Scott et al. [12] and Forbes et al. [13]. In animals sensitized with egg albumin challenged with antigen, the fasting motility pattern was disrupted, the migrating motor complex was abolished and the frequency of aborally propagating cluster contractions was increased. Studies by Forbes in Hooded Lister rats have shown that IgE-mediated hypersensitivity reaction to intraluminal food proteins causes mast cell degranulation, mucosal damage and decreased net absorption of Na^+ and H_2O due to active Cl^- secretion. The two studies can only speak in favor of the hypothesis that food allergy or gastrointestinal anaphylaxis is responsible for motility disorders and diarrhea, but they cannot be used to tell that allergy is surely a factor in IBS and to validate the use

of DSCG in IBS with diarrhea. Moreover, the presence of mucosal damage excludes the diagnosis of IBS that for definition is a functional syndrome. Stefanini et al. [11] did not show any mucosal alteration or local anaphylaxis or any evidence of immunological mechanism. They used an open challenge and used the response to DSCG to prove 'food hypersensitivity'. They followed up for 1 year 35 patients with positive response to the DSCG course. Twenty-five of them had not needed any further medication. Eight eliminated from their diet foods that created a positive reaction on skin prick test. The answer to this paper was given by the same authors in the first two lines of the discussion in which they underline the fact that an open trial does not allow any definitive conclusion. Nevertheless, in their conclusion they affirm that an open challenge is markedly more simple than a double-blind, placebo-controlled food challenge, therefore more suitable for gastrointestinal practice and they suggest IBS with diarrhea could be candidate for IgE-mediated reaction. In allergy practice a single-blind challenge does not satisfy the criteria for the diagnosis of food allergy.

Pearson et al. [14] studied 23 patients who attributed a wide variety of symptoms to food allergy. They used exclusion diets and double-blind provocation. Hypersensitivity was confirmed in 4 patients, each of whom presented with typical atopic symptoms. All had allergic rhinitis and a history of urticaria. Three had asthma and 2 atopic eczema. Two patients had immediate oral itching and swelling followed by abdominal pain after food provocation and reported food-induced asthma. None of these had psychological symptoms. No food allergy was found in the other 19 patients. They were polysymptomatic (people with IBS are usually polysymptomatic) and attributed a variety of symptoms to food allergy. None of them had skin prick test positive to foods. A high evidence of psychiatric disorders was found in these patients. Patients with IBS have been found in some studies to have increased prevalence of psychiatric diagnosis: personality disorders, anxiety, depression, and somatization [15–17]. Some patients with IBS are quite adamant that their symptoms are due to particular food because they want to find an easy explanation and a plausible cause to their problems.

Patients with IBS report chronic stress. In some studies stressful events were more frequent among patients with IBS [18]. However, it is the chronic mental stimulation by something that the patient perceives as wrong, the conflict between a social artificial self and his/her true self that might influence the gastrointestinal motility and symptoms. Patients who struggle in order to affirm their true self, but they are never winners, are more prone to have abdominal pain and constipation. Patients who are prisoners of their nonsatisfying social self, who give up and feel themselves as losers, have more often diarrhea. The alteration of coping and given up behaviors might explain the alternation of constipation and diarrhea. However, this is only a hypothetical explanation among several different and even plausible explanations for the genesis of IBS.

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