6.5 Irritable Bowel Syndrome

HEINZ KRAMMER, FRANKA NEUMER

6.5.1 Definition

- Irritable bowel syndrome (IBS) (synonym: spastic colon) is characterised by abdominal discomfort or pain, associated with altered bowel function (diarrhoea and/or constipation) and disordered defaecation.
- There are no diagnostic biochemical, physiological or structural abnormalities in IBS.

Over the years groups of experts have developed clinical measures based on positive symptom analysis. Manning and colleagues were the first to propose key symptoms ("Manning criteria") to help the diagnosis of IBS. The Rome I, II and III criteria are the results of multinational consensus workshops. Table 6.5.1 lists the symptom-based criteria which are so far established for the diagnosis of IBS. The Rome classification system characterises IBS in terms of multiple physiological determinants contributing to a common set of symptoms rather than a single disease entity. The current Rome III criteria subtype IBS according to the stool form by using the Bristol Stool Form Scale.

The IBS-related symptoms overlap with those of other diseases. Experienced clinicians often diagnose these disorders on symptoms alone, but, as functional disorders are so much more common than organic diseases, any diagnostic strategy is likely to have a deceptively high positive predictive value.

6.5.2 Epidemiology

Irritable bowel syndrome is one of the most common disorders in gastrointestinal clinical practice. The overall prevalence rate is similar (10–20%) in most industrialised countries. These findings reflect the tremendous impact of IBS on social costs due to healthcare use, drug consumption and absenteeism from work. The exact prevalence of IBS is poorly defined, probably because of the different definitions and clinical criteria used to define the syndrome. Similarly, the incidence of IBS is unknown, but it has been estimated at almost 1% per year. This certainly underestimates the real incidence of IBS as only one in three patients seek doctors. Those who do consult a doctor report more severe symptoms and an increased level of psychological disturbance (anxiety, depression, as well as sleep disturbance).

IBS is commonly believed to be a female disease. IBS symptoms are at least twice as common in women as men. The reasons why women appear to be more prone than men to IBS are unknown, although health-seeking behaviour and other factors may play a role in this gender predominance. Interestingly, straining and passage of hard stools are more common in women while frequent and loose stools are more common in men.

The first presentation of patients to a physician is between the ages of 30 and 50 years, and there is a decrease in reporting frequency among older people.

6.5.3 Aetiology/Pathophysiology

Since the mid 1990s significant advances have been made in the understanding of the pathophysiology of IBS. For many patients the most consistent, and probably interrelated, characteristics are:

- Altered intestinal motility
- Visceral hypersensitivity
- Postinfection bowel dysfunction
- Dietary factors
- Stress as well as psychological morbidity

6.5.3.1 Altered Motility

Abnormal small intestinal and colonic motility has been demonstrated in IBS patients and in some patients it has been shown to correlate with symptoms. Abnormalities of intestinal motility may lead not only to the onset of pain but also to bloating and, if the abdominal motility results in changes in intestinal transit, constipation and diarrhoea.

6.5.3.2 Visceral Hypersensitivity

Patients with functional bowel diseases exhibit decreased pain thresholds to balloon distension of the gut. This was

Table 6.5.1 Symptom-based criteria so far established for the diagnosis of IBS

Manning
• Pain relieved by defaecation
• More frequent stools at the onset of pain
• Looser stools at the onset of pain
• Visible abdominal distension
• Passage of mucus
• Feeling of incomplete evacuation
Rome I
Abdominal pain or discomfort for at least 3 months with at least one of the following symptoms:
• Relieved with defaecation
• Associated with a change in frequency of stools
Associated with a change in form of stools and two more of the following symptoms:
• Altered stool frequency and/or form, altered stool passage
• Passage of mucus
• Bloating or abdominal distension
Rome II
At least 12 weeks, which need not be consecutive, in the preceding 12 months of abdominal discomfort or pain that has two of three features:
• Relieved with defaecation; and/or
• Onset associated with a change in frequency of stool; and/or
• Onset associated with a change in form (appearance) of stool
Symptoms that cumulatively support the diagnosis of IBS:
• Abnormal stool frequency (less than or more than three bowel movements per week)
• Abnormal stool passage (straining, urgency or feeling of incomplete evacuation)
• Passage of mucus
• Bloating or feeling of abdominal distension
Rome III
Diagnostic criteriaa for IBS. Recurrent abdominal pain or discomfortb at least 3 days per month in the last 3 months associated with two or more of the following:
1. Improvement with defaecation
2. Onset associated with a change in frequency of stool
3. Onset associated with a change in form (appearance) of stool
Subtyping IBS by predominant stool pattern
1. IBS with constipation (IBS-C): hard or lumpy stools ≥ 25% and loose (mushy) or watery stools < 25% of bowel movements
2. IBS with diarrhoea (IBS-D): loose (mushy) or watery stools ≥ 25% and hard or lumpy stool < 25% of bowel movements
3. Mixed IBS (IBS-M): hard or lumpy stools ≥ 25% and loose (mushy) or watery stools ≥ 25% of bowel movements
4. Unsubtyped IBS: insufficient abnormality of stool consistency to meet criteria for IBS-C, D or M

[a]Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis

[b]Discomfort means an uncomfortable sensation not described as pain. In pathophysiology research and clinical trials, a pain/discomfort frequency of at least 2 days a week during screening evaluation for subject eligibility

first described in the rectum of patients with IBS almost 30 years ago and subsequently confirmed by others. In addition, it is often noted with air insufflation during colonoscopy. This phenomenon is referred to as visceral hyperalgesia. Explanations for this include an alteration of the sensitivity of sensory receptors through the recruitment of nociceptors in response to infection, intraluminal factors, ischaemia, distension or psychiatric factors There may be increased excitability of the neurons in the dorsal horn of spinal cord, and centrally there may be differences in the way the brain modulates afferent signals from the dorsal horn neurons through ascending pathways.

6.5.3.3 Gastrointestinal Infection

There is an increased risk of patients developing IBS symptoms following an episode of gastrointestinal infection. It was shown that around one third of patients hospitalised for infectious diarrhoea had developed new IBS. In most cases, persistent bowel dysfunction was noted in patients following documented *Campylobacter*, *Shigella* and *Salmonella* gastroenteritis. Factors predisposing to persisting symptoms are severity and duration of diarrhoea, anxiety, depression and somatisation, as do adverse life events. Mechanisms underlying postinfection IBS are unclear, but immunological abnormalities at the intestinal level have been demonstrated in these patients, as has increased mucosal T lymphocytes and serotonin-producing enteroendocrine cells. Also, response to the pathogen is undoubtedly influenced by genetic factors that influence immune response.

6.5.3.4 Dietary Factors

Many patients with IBS believe that their symptoms are food related and some have considerably restricted their diet by the time they consult. The gut has an extensive immune system but current understanding of processing of food antigens in health and disease is limited. At present no clinically useful marker is available to test for food hypersensitivity in IBS. Researchers have employed both skin tests and serum immunoglobulins (IgG and IgE) as markers of food hypersensitivity in various disorders including IBS, but published data are equivocal. Moreover, many unscrupulous practitioners are benefiting from the confusion, leading patients to more and more restricted and illogical diets.

The role of sugar malabsorption in the pathogenesis of IBS is still a debated problem. Demographic data show that the prevalence of IBS patients with sugar malabsorption is similar to that found in controls. Symptoms, such as diarrhoea and bloating, can typically be reproduced by lactose intake and reduced following lactose exclusion from the diet. Lactose malabsorption may coexist with IBS. Nevertheless, a lactose-free diet is effective in improving symptoms only in about 10% of patients with IBS.

True food allergy is much less common. It is usually not difficult to recognise if food ingestion is associated with urticaria, asthma, eczema, angiooedema and rhinorrhoea with a high incidence of positive skin prick or high RAST scores. Such patients see an immunologist rather than a gastroenterologist and are not usually thought to have IBS.

6.5.3.5 Stress and Psychological Morbidity

Psychological observations have shown that psychological symptoms of anxiety and depression are more common in IBS patients than either healthy volunteers or patients with organic gastrointestinal disease. More than 50% linked the onset of their symptoms to a stressful event such as employment difficulties, family death, a surgical procedure or marital stress. Clinicians agree that stress can cause symptoms of IBS, but it cannot be seen as the only cause. The magnitude of psychological stress also correlates with symptomatic outcome. Important in regard to psychological stress is the recently demonstrated association of sexual, emotional or verbal abuse with IBS. Sexual abuse, often combined with physical abuse, has been reported in 20–30% of patients with IBS. These findings are significantly more common than in the general population or in patients with organic disease.

6.5.4 Symptoms

- Irritable bowel syndrome patients suffer from various gastroenterological symptoms. These include recurrent abdominal pain, altered bowel function, bloating, abdominal distension, the sensation of incomplete evacuation and the increased passage of mucus (Table 6.5.1).
- In addition, several *non-gastroenterological symptoms* are more frequent in IBS patients such as lethargy, poor sleep, fibromyalgia, backache, urinary frequency and dyspareunia.
- Anxiety, depression and somatisation are frequent but do not reliably discriminate between IBS and other gastrointestinal diseases.
- Functional diseases such as IBS usually interfere with the patients' comfort and their daily activities.
- On the other hand, IBS is a benign disorder and there are no long-term organic complications such as cancer or colitis.

6.5.5 Diagnosis

- The diagnosis of IBS is based on the identification of symptoms consistent with the syndrome (Table 6.5.1).
- The first step is a careful assessment of the patient's symptoms. Patients should be carefully interviewed. Ideally, no time limitation should exist as patients need to think about the diagnosis.
- Second, IBS is diagnosed after excluding structural or biochemical abnormalities that could indicate organic or other functional disorders.

6.5.5.1 Physical Examination

- A physical examination should be performed on the first visit and subsequent visits as needed to exclude findings not consistent with IBS and to meet patients' expectations of a thorough evaluation.
- A pelvic examination is often indicated for lower abdominal/pelvic symptoms and/or if there is a change in menstrual pattern.
- A rectal examination, particularly for patients reporting symptoms of incontinence and constipation, can help to identify a lax sphincter or paradoxical pelvic floor muscle contraction.

6.5.5.2 Investigation

- These tests include:
  - Complete blood cell count and sedimentation rate
  - Serum chemistry
  - Thyroid-stimulating hormone (TSH)
  - Stool haemoculture
- Additional tests are performed depending on the age of the patient and the predominant clinical picture.
- Abdominal ultrasound contributes little in the evaluation of patients with suspected IBS.
- Colonoscopy is recommended for patients over age 50 years due to higher pretest probability of colon cancer. In younger patients, performing a colonoscopy or sigmoidoscopy is determined by clinical features suggestive of disease and may not be indicated.

Pain-predominant Symptoms

- The persistence of pain often requires plain abdominal radiography during an acute episode to exclude bowel obstruction and/or other abdominal pathology.
- Additional imaging studies (e.g. small-bowel radiography, CT scan) may be necessary if there are other symptoms present (e.g. vomiting, weight loss).

Constipation-predominant Symptoms

- In patients with infrequent bowel movements, measurement of the whole gut transit time is indicated to discriminate between IBS and slow-transit constipation or outlet obstruction.
- When symptoms of dyschesia or incomplete evacuation are prominent, suggesting obstruction to defaecation, further anorectal tests are required including anorectal motility testing and defaecography.

Diarrhoea-predominant Symptoms

- If diarrhoea is persistent a stool sample should be examined for pathological bacteria, ova and parasites.
- Exocrine pancreas insufficiency should be excluded.
- Small-bowel biopsy and aspirate should be obtained for *Giardia lamblia* or sprue.
- A colonoscopy (possibly with ileoscopy) and multiple biopsies are necessary to exclude inflammatory bowel disease.
- Colonic biopsies can be considered to evaluate for collagenous or microscopic colitis.
- Especially, when postprandial symptoms of bloating accompany the diarrhoea, a breath hydrogen test to exclude bacterial overgrowth is helpful.
- Lactose intolerance and other carbohydrate malabsorption (e.g. fructose, sorbitol) are common causes of diarrhoea.
- Rare cases of diarrhoea include metabolic disorders such as diabetes (due to autonomic neuropathy and motility disorders), hormonal abnormalities (e.g. hyperthyroidism), other causes of malabsorption (e.g. chronic pancreatitis) and endocrine tumours secreting serotonin, vasoactive intestinal polypeptide or gastrin (Table 6.5.2).

6.5.6 Management and Therapy

Making a definitive diagnosis helps both doctor and patient by reassuring them that it is unlikely that another alternative diagnosis will emerge over the ensuing years. Doctors should avoid comments such as "it is untreatable" or "you will learn to live with it" as this quite obviously results in despondency. However, patients often appreciate a short tutorial on the anatomy and physiology of the gut as well as being informed about the current theories on pathophysiology, such as motility and visceral sensitivity. Some information on the role of stress and psychological factors, if put in simple terms, is also recommended, e.g. "stress can make symptoms worse but does not cause IBS".

Table 6.5.2 Rare differential diagnoses (Dapoigny 1998)

Carbohydrate malabsorption: fructose, sorbitol
Food intolerance: IgE or non-IgE mediated
Bile salt malabsorption: primary, secondary
Hormone-induced diarrhoea: medullary carcinoma of the thyroid, gastrinoma, VIPoma, glucagonoma
Rare forms of colitis: gold colitis, collagenous colitis, lymphocytic colitis, pericrypt eosinophilic colitis
Intestinal pseudo-obstruction: myopathy, neuropathy

6.5.6.1 Lifestyle Advice

Lifestyle advice means a carefully dietary and lifestyle history to identify food fads or deficiencies, e.g. excess or lack of dietary fibre. Other common factors are lack of exercise as well as not allowing adequate and suitable time for regular defaecation, which are particularly relevant to constipated IBS sufferers. Patients should be instructed to keep a two-week diary of symptoms, stresses and dietary intake to identify any trigger factors.

6.5.6.2 Dietary Factors

Food products have variously been reported as perpetuating or treating IBS. For instance, especially patients who suffer from diarrhoea and bloating may have excessively large intakes of indigestible carbohydrate, fruits or caffeine. They may also benefit from a diet low in lactose and/or fructose. Constipated patients with low fibre intake should be given a trial of a high fibre diet. However, there is growing evidence that bran can upset the symptoms of IBS whereas soluble forms of fibre (e.g. Ispaghula) tend to be more effective and have less adverse effects such as bloating. Exclusion diets may be useful in controlling symptoms in some patients.

6.5.6.3 Psychotherapy

Patients with anxiety but without psychiatric disease who do not respond satisfactorily to the above may benefit from relaxation therapy. On the other hand, patients with prominent psychiatric morbidity may respond to psychotherapy or cognitive behavioural therapy or require conventional psychiatric treatment.

6.5.6.4 Conservative Medical Treatment

Recommended European Standard

One of the commonest problems facing clinicians treating patients with IBS is the lack of uniformity of symptoms. In the majority of cases, current pharmacological treatments have limited value. However, for those patients who require therapy for specific symptoms, the following treatments have proved effective (summarised in Table 6.5.3).

Abdominal Pain and Bloating

- For pain and bloating, antispasmodic medication should be considered. These drugs have differing modes of action, some exhibiting anti-smooth muscle activity (e.g. mebeverine) and others anticholinergic activity (e.g. butylscopolamine).
- Antidepressants are currently the most effective drugs for treating IBS as they not only treat underlying depression but also modify gut motility and alter visceral nerve responses. However, tricyclic antidepressants can intensify constipation. That is why pain-predominant patients who also suffer from constipation should be given selective serotonin reuptake inhibitors. The most advanced area of research in the field of IBS is that of drugs that modify 5-HT in the gut (5-HT antagonists and 5-HT agonists). The major receptor targets that have been explored are the 5-HT_3 and 5-HT_4 receptors.
- There have been a number of trials of probiotics in IBS though patient numbers as well as treatment periods are rather small. However, *Lactobacillus plantarum* has proven efficacious in predominant meteorism and abdominal pain.

Diarrhoea

- Loperamide slows small and large intestinal transit and reduces stool frequency and urgency in patients with diarrhoea-predominant IBS.

Table 6.5.3 Symptom-directed therapy for IBS

Pain-predominant	Antispasmodics (e.g. mebeverine, butylscopolamine)
	5-HT_4 partial agonists (tegaserod)
	Antidepressants (amitriptyline, *cave*: constipation)
	Selective serotonin reuptake inhibitors (fluoxetine)
Meteorism-predominant	Polydimethylsiloxane (dimethicone)
	Probiotics (*Lactobacillus plantarum*)
	Herbal remedies (*Iberis amara*)
Diarrhoea-predominant	Ispaghula husk
	Loperamide
Constipation-predominant	Ispaghula husk
	Probiotics (EcN, LcS)
	Herbal remedies (*Iberis amara*)
	Osmotic laxatives (polyethylene glycol)
	5-HT_4 partial agonists (Tegaserod)
	CO_2 laxatives (suppositories) to support evacuation

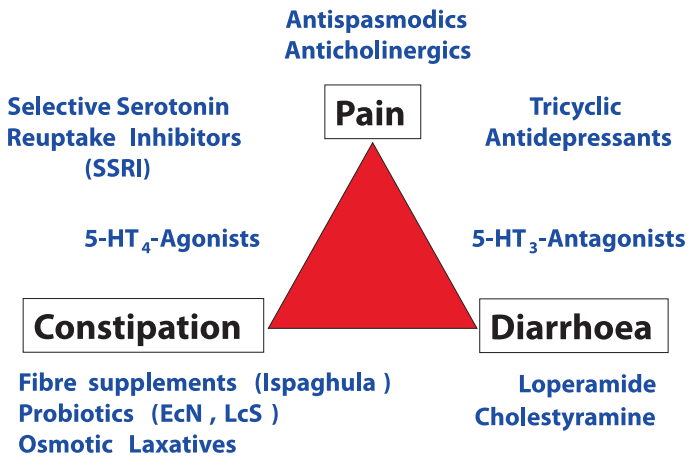

Fig. 6.5.1 Practical guide to the therapy of IBS

- Cholestyramine may also be considered as about 10% of diarrhoea-predominant IBS patients show evidence of bile salt malabsorption.
- Fibre supplements such as Ispaghula husk and psyllium may be helpful to increase stool consistency.

Constipation

- Patients with IBS and constipation should be given a trial of increased intake of dietary fibre to increase stool weight and accelerate gut transit. In particular, Ispaghula husk is a useful alternative to wheat bran as it does not lead to meteorism and flatulence.
- Probiotics such as *E. coli* strain Nissle 1917 (EcN), *Lactobacillus plantarum* and *L. casei Shirota* (LcS) have been shown to increase stool frequency and soften stool consistency.
- Osmotic laxatives such as polyethylene glycol may be used.

The symptom-based therapy of IBS is summarised in Fig. 6.5.1.

6.5.7 Prognosis

Irritable bowel syndrome is generally regarded as a chronic relapsing condition. There is no cure for IBS, but symptoms can be managed with dietary changes, stress reduction and, if necessary, medication. Therefore, the prognosis is likely to be individualised based on patient's anticipation and a successful management.

Previous abdominal surgery has a poor prognostic implication in IBS. Patients undergoing surgery are likely to be more symptomatic in the postoperative year than are non-IBS patients. Underlying reasons involve a questionable indication for the surgery and possible alterations in gut physiology following the procedure.

Suggested Reading

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