

Efficient diagnosis of suspected functional bowel disorders

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SUMMARY

Functional bowel disorders (FBDs) are common disorders that are characterized by various combinations of abdominal pain and/or discomfort, bloating and changes in bowel habits. At present, diagnosing FBDs often incurs considerable health-care costs, partly because unnecessary investigations are performed. Patients are currently diagnosed as having an FBD on the basis of a combination of typical symptoms, normal physical examination and the absence of alarm features indicative of an organic gastrointestinal disease. Basic laboratory investigations, such as a complete blood count, measurement of the erythrocyte sedimentation rate and serological tests for celiac disease, are useful in the initial evaluation. No further investigations are needed for most patients who have typical symptoms and no alarm symptoms. The most important alarm symptoms include signs of gastrointestinal bleeding, symptom onset above 50 years of age, a family history of colorectal cancer, documented weight loss and nocturnal symptoms. The presence of alarm symptoms obviously does not exclude an FBD, but further investigation is needed before confirmation of the diagnosis. For patients with predominant and severe diarrhea, a more thorough diagnostic work-up should normally be considered, including colonoscopy with colonic biopsies and a test for bile-acid malabsorption.

KEYWORDS alarm symptoms, colonoscopy, functional bowel disorder, irritable bowel syndrome, Rome III criteria

REVIEW CRITERIA

PubMed/MEDLINE was searched in January 2008 for English-language articles published from 1970 to 2008. Medical subject heading (MeSH) terms "irritable bowel syndrome" and "functional bowel disorders" were used in combination with "diagnosis" and "Rome criteria", and important differential diagnoses such as "celiac disease", and different diagnostic tests and procedures such as "colonoscopy" and "hydrogen breath test". Review articles and guidelines describing the diagnostic approach to functional bowel disorders were reviewed and their reference lists were checked for additional relevant information. The reference list was updated in May 2008.

CME

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Learning objectives

Upon completion of this activity, participants should be able to:

- 1 List the types of functional bowel disorders.
- 2 Describe the features of irritable bowel syndrome.
- 3 Identify the diagnostic criteria for irritable bowel syndrome.
- 4 Define functional constipation.
- 5 List alarm ("red flag") symptoms suggestive of organic disease in patients suspected of having functional bowel disorders.

Competing interests

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INTRODUCTION

Functional bowel disorders (FBDs) are a group of functional gastrointestinal disorders associated with lower gastrointestinal tract symptoms, for which clinical investigations do not reveal any organic cause.¹⁻⁴ Included in this group of disorders are IBS, functional diarrhea, functional constipation and functional bloating. IBS affects 5-15% of the general population¹⁻³ and is probably responsible for most gastroenterology consultations.⁵ In a population-based survey, FBDs other than IBS were also found to be very common,⁶ and diagnostic criteria for an FBD were fulfilled by 34% of subjects. FBDs are more common in women than in men,^{3,6,7} and their prevalence tends to decrease with increasing age, even though a considerable proportion of elderly people also suffer from functional gastrointestinal disorders.⁸

Box 1 The Rome III diagnostic criteria for IBS.

Recurrent abdominal pain or discomfort at least 3 days per month in the past 3 months (with symptom onset at least 6 months prior to diagnosis) associated with two or more of the following:

- Improvement with defecation
- Onset associated with a change in stool frequency
- Onset associated with a change in stool form (appearance)

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FBDs have a substantial economic impact because of their high prevalence and their often chronic and relapsing nature.⁹ IBS is also commonly associated with somatization:¹⁰ patients frequently complain of extraintestinal symptoms such as backache, headache, urinary tract symptoms and lethargy,¹¹ which lead to additional health-care seeking and increased costs. Moreover, patients with IBS often have symptoms related to other parts of the gastrointestinal tract.¹² It is, therefore, common for patients to undergo several investigations that provide negative results, including various blood tests, stool studies, breath tests, abdominal imaging and upper and lower endoscopy, before a diagnosis is made.

Of course, it is equally important to identify those patients who present with gastrointestinal symptoms but have an organic disease instead of a functional gastrointestinal disorder. IBD, colorectal cancer, celiac disease, gastrointestinal motility disorders and bile-acid malabsorption are differential diagnoses that are often ruled out before an FBD is diagnosed. In this Review, we consider the existing literature concerning appropriate diagnostic evaluation of patients with a suspected FBD. The main focus of the Review is on IBS, as this syndrome is the FBD for which most information is available.

SYMPTOMS

As there are no organic changes that characterize FBDs, symptom-based diagnostic criteria are used to define patients who have an FBD. The first symptom-based diagnostic criteria for FBDs to be developed were the Manning criteria¹³ in 1978, followed by the Rome I criteria,¹⁴ Rome II criteria,¹⁵ and the current Rome III criteria.⁴ Even though the diagnosis of different functional gastrointestinal disorders is made on the basis of

different combinations of symptoms, upper and lower gastrointestinal symptoms often overlap, and many patients fulfill diagnostic criteria for several functional gastrointestinal disorders.^{12,16,17} Moreover, there is also considerable instability in symptoms over time^{7,18,19} and patients who have predominant IBS symptoms at one point in time often have functional upper gastrointestinal symptoms a couple of years later.²⁰ In fact, the overlap in symptoms and symptom instability probably supports the diagnosis of a functional gastrointestinal disorder, even though this assumption has not formally been validated.

Gastrointestinal symptoms are very common in the general population and most individuals who report symptoms have a functional gastrointestinal disorder.²¹ According to the Rome III criteria for FBDs, symptom onset must have occurred at least 6 months before diagnosis and symptoms must have been present on 3 days or more per month during the 3 months preceding diagnosis.²² This specification separates FBDs from transient gut symptoms and demonstrates current activity.

Irritable bowel syndrome

The diagnostic criteria for IBS include recurrent abdominal pain or discomfort associated with altered bowel habits (Box 1).⁴ Supportive symptoms include abnormal stool frequency, hard or loose stools, defecation straining, urgency, the feeling of incomplete bowel movement, passing mucus and bloating—the more of these symptoms the patient has the more likely it is that they have IBS.

There is also a considerable overlap of IBS symptoms with those of functional dyspepsia,^{12,16,17} and symptoms of nausea, epigastric pain, postprandial fullness and early satiety are, therefore, also common in patients with IBS. Psychiatric disorders such as depression, anxiety and somatization are also associated with IBS,^{10,23–26} and somatization has a role in the association between IBS and extraintestinal symptoms. Lethargy, backache, headache, urinary tract symptoms and female dyspareunia are all more common in patients who have IBS than in the general population.^{26,27} The presence of extraintestinal symptoms enables a more confident diagnosis of IBS to be made,²⁸ and should normally lead to fewer rather than more investigations.

Patients with IBS are subgrouped according to the Rome III criteria on the basis of predominant stool form alone.⁴ The previous Rome II subgrouping was, in addition to predominant

stool form, also based on stool frequency and the presence of urgency and incomplete bowel emptying,¹⁵ and was highly unstable over time.¹⁸ Whether the subgrouping of patients with IBS according to the Rome III criteria also proves unstable remains to be seen. From a clinical point of view, subgrouping is relevant to the treatment of choice and also to diagnostic evaluation (see below).

Functional bloating

Functional bloating is defined as the presence of both the recurrent feeling of bloating or visible abdominal distension and insufficient criteria for a diagnosis of functional dyspepsia, IBS or other functional gastrointestinal disorders.⁴ Typically the symptoms worsen after meal intake and throughout the day and improve overnight. An objective finding of increased abdominal girth is seen in some, but not all, patients and the correlation of increased abdominal girth with symptoms is rather poor.²⁹

Functional constipation

The definition of constipation differs widely among patients and it is of great importance to evaluate what the patient means by constipation. A large proportion of patients who consider themselves constipated fulfill the diagnostic criteria for IBS. Other patients instead have what is known as functional constipation. Functional constipation is defined as the presence of two or more of the following symptoms: at least 25% of the time during defecation is spent straining, passing lumpy or hard stools, a sensation of incomplete evacuation, a sensation of anorectal obstruction, or defecation fewer than three times per week.⁴ In addition, the passing of loose stools without the use of laxatives should rarely be present and the criteria for IBS should not be fulfilled.

Functional diarrhea

Functional diarrhea is characterized by the passage of loose (mushy) or watery stools in the absence of abdominal pain or discomfort.⁴ Often the stool frequency is also increased and urgency is a prominent problem, but these findings are not prerequisites for a diagnosis of functional diarrhea. A more thorough diagnostic work-up is usually needed in patients who have suspected functional diarrhea before a confident diagnosis of an FBD can be made, since organic gastrointestinal diseases like IBD, microscopic colitis and bile-acid malabsorption have very similar symptoms.

Functional abdominal pain syndrome

Functional abdominal pain syndrome is a pain syndrome attributed to the abdomen poorly related to gut function.³⁰ In the Rome III criteria, functional abdominal pain syndrome is not included among the FBDs but is considered to be an entity in its own right, one that is often associated with complex psychiatric problems. This pain syndrome is characterized by continuous or nearly continuous pain that is unrelated to physiological events such as eating or defecation.³⁰ The high symptom severity means that diagnosis is often preceded by several investigations, but thereafter it seems to be of great importance to abstain from further diagnostic testing and concentrate on establishing an effective physician–patient relationship.

DIAGNOSTIC MANAGEMENT

Symptom-based diagnostic criteria

A patient's clinical history forms the basis for diagnosing an FBD, and it is therefore of vital importance to allow the patient to tell their history in their own words. On the basis of the patient's clinical history, symptom-based criteria can be used, and for most patients with a typical history suggestive of an FBD few clinical investigations are subsequently needed.

In an attempt to simplify and standardize the diagnosis of FBDs, several symptom-based diagnostic criteria have been developed.^{4,13–15} So far, these criteria have primarily been used in research to define the study population included and their use in clinical practice is limited. Moreover, agreement between an IBS diagnosis made by a general practitioner and one made by using diagnostic criteria is poor.³¹ Agreement between different diagnostic criteria also varies: the Rome II criteria are considered more restrictive than the Rome I and Manning criteria.^{32,33} Comparison between the Rome II and Rome III criteria reveals a higher prevalence of IBS according to the Rome III criteria.⁶ This difference is, however, probably partly due to the redistribution of patients within the group of FBDs, since the overall prevalence of FBDs does not differ markedly between the Rome II and III criteria.⁶ Of note, there seems to be poor agreement in subtyping patients with IBS according to the predominant bowel habit based on the Rome II versus the Rome III criteria.³⁴

Evidence does support the use of symptom-based criteria for diagnosing FBDs.³⁵ Use of the Rome I or II criteria in the absence of red flag symptoms (see below) has been shown to be

Box 2 Red flag symptoms or alarm features that should alert the clinician of a possible organic gastrointestinal disease.

- Symptom onset in patients older than 50 years of age
- Blood in the stools
- Unintentional weight loss
- A family history of colon cancer
- Nocturnal symptoms

reasonably sensitive, highly specific and able to give a positive predictive value of nearly 100% for the diagnosis of IBS,^{36,37} although one more-recent study achieved markedly inferior results.³⁸ This difference in results might be due to differences in the patient populations studied: the latter study included more patients from primary care and general gastroenterology clinics. One problem is that diagnostic symptom-based criteria are potentially most useful in primary care, but it is in this setting that the evidence for their use is most weak.^{39,40} This weakness has led to the proposal of alternative diagnostic criteria that could be more useful in primary care than the present Rome criteria, with the defining features of IBS being alteration in bowel habit, bloating and abdominal pain, or discomfort or annoyance.⁴¹

Of great importance, IBS also seems to be a 'safe' diagnosis. The diagnosis of an FBD is highly stable over time, with few patients needing their initial diagnosis to be revised. Indeed, studies have demonstrated a re-diagnosis rate of 0.0–4.5% when patients initially diagnosed with IBS were re-evaluated at least 2 years (range 2–30 years) later.^{37,42–44} These results are encouraging for clinicians and seem to suggest that the risk of misdiagnosis is very small; however, this assumption is based on limited and somewhat dated evidence, and new studies are needed to evaluate how safe a diagnosis of FBD is when modern diagnostic criteria are used.

Alarm features or red flag symptoms

Red flag symptoms or alarm features (Box 2) that should alert the clinician to the possibility that organic disease is present have been used in combination with diagnostic criteria for IBS in clinical studies. When patients meet the Rome criteria and there are no red flags or alarm features present, the diagnosis of IBS seems to be secure.³⁷

However, one study showed that a large proportion of patients who have FBDs present with at least one alarm feature and that incorporating the exclusion of these alarm features in the diagnostic criteria would not improve sensitivity, but would leave many patients undiagnosed.³⁸

In our opinion, alarm features should be considered as indicators for additional diagnostic evaluation, rather than contradictory to a functional diagnosis. Various alarm features have been proposed, but few have been confirmed to be clinically useful for the identification of organic disease and exclusion of an FBD. Age above 50 years at symptom onset, blood in the stools and colonic carcinoma in a first-degree relative have been found, in several studies, to indicate the possible presence of serious organic disease, necessitating further diagnostic work-up.^{36,38,45}

In one study, unintended weight loss had reasonably high sensitivity for detecting gastrointestinal cancer,³⁸ but this was not the case in two other studies.^{36,45} Gastrointestinal symptoms at night is normally not considered to be a typical symptom of FBDs, but it is not that uncommon.⁴⁶ In a study by Hammer *et al.* nocturnal pain did not indicate organic disease,³⁶ whereas Whitehead *et al.* found a modest association between being awakened by gastrointestinal symptoms and organic gastrointestinal disease.³⁸ Other proposed red flag symptoms are recent antibiotic use and the presence of slight fever,^{36–38} but these findings need to be confirmed in additional studies. Diarrhea *per se* is not considered to be a red flag symptom, but its presence is associated with an increased likelihood of finding an organic gastrointestinal disease.³⁶ In conclusion, the presence or absence of alarm features should be incorporated into the clinical history taking in a patient with a suspected FBD, and if they are present further diagnostic work-up should be considered.

Laboratory investigations

In a large proportion of patients who have a suspected FBD, some kind of blood test is included in the clinical work-up (e.g. complete blood count [CBC], measurement of C-reactive protein concentration and erythrocyte sedimentation rate [ESR]). Analyzing thyroid hormones concentrations, fecal occult blood testing, and fecal tests for the presence of ova and parasites are also part of the routine clinical work-up in many settings. The scientific evidence supporting the performance of most of these tests is, however, poor.

One study that included patients who had suspected IBS⁴⁷ showed that CBC, fecal occult blood testing or fecal tests for ova and parasites had no diagnostic yield, and the last of these tests was confirmed as having no diagnostic yield in another study.⁴⁸ In two large studies, significantly higher ESRs have been found in patients with organic disease than in those with IBS,^{45,49} and in one of the studies leukocytosis was also more common in the group with organic disease.⁴⁵ It is worth noting, however, that the patient selection in these two studies was such that a high proportion of organic gastrointestinal disease was to be expected and patients were not primarily a population with presumed FBDs. Interestingly, an investigation performed in a population of patients who met the diagnostic criteria for IBS showed no diagnostic yield for ESR.⁴⁷

Fecal markers of inflammation, such as calprotectin and lactoferrin, are increasingly used in clinical practice. These markers are highly accurate at discriminating IBS from organic disease, primarily IBD, and seem to be superior to C-reactive protein levels.^{49,50} Whether these tests markedly improve diagnostic management in patients primarily suspected of having an FBD according to the Rome criteria remains to be proven, although some results seem to suggest that this is the case.⁴⁹ Studies of routine serological testing for thyroid dysfunction in patients with suspected FBD, by the measurement of thyroid-stimulating hormone concentrations, have failed to show its relevance.^{47,48} Such testing is, therefore, not recommended unless additional findings support the suspicion of thyroid dysfunction.

Taking the available scientific evidence and the costs of the different tests into consideration, it might be adequate to include CBC and ESR in the routine clinical work-up of patients with suspected FBDs, supplemented with the measurement of calprotectin concentrations if there is a reasonable clinical suspicion for IBD.

Celiac disease

Individuals with celiac disease can present with symptoms similar to those of patients with FBDs. Although study findings are partially divergent, evidence points towards an increased pre-test probability of celiac disease in patients who meet the diagnostic criteria for IBS.⁵¹ In addition, the available evidence suggests that in areas where there is a high prevalence of celiac disease, patients with suspected FBDs should be tested for celiac disease.⁵²⁻⁵⁵ Justification for celiac disease

testing in patients with suspected FBDs is further strengthened by the fact that a diagnosis of celiac disease changes the management of the patient radically, in that the disease can be managed by changing the patient's diet. Analysis of the presence of endomysial antibodies or tissue transglutaminase antibodies is highly sensitive and specific for celiac disease,⁵⁶ and considering the cost-benefit implications, we recommend testing for celiac disease as a first-line investigation before endoscopy with duodenal biopsies in patients with symptoms compatible with an FBD.^{57,58}

It should be noted that the cost-effectiveness of testing for celiac disease is dependent on the prevalence of celiac disease in that specific population. For example, one study found that the cost of testing for celiac disease in patients with IBS was acceptable when the prevalence of celiac disease was above 1%.⁵⁸ Unfortunately, accurate data on the prevalence of celiac disease are not available for all countries, making it difficult to recommend this approach in every country. As celiac disease is a manageable disease, however, we advocate having a low threshold for testing for celiac disease in patients with symptoms compatible with an FBD.

Examination of the colon

Up to 50% of patients who have IBS undergo some form of colon examination during the course of diagnostic evaluation,^{59,60} such examination is even more common in patients with IBS who are older than 45 years of age.³⁷ The preferred investigation for colon examination is colonoscopy, but contrast radiography of the colon is still commonly used in patients who have a suspected FBD.^{37,59,60}

The reason to examine the colon of patients who have a suspected FBD is to look for alternative causes for the symptoms; early diagnosis of colorectal cancer before the onset of cancer-related symptoms improves survival, even though the effect of diagnostic and therapeutic delay on survival once symptoms have occurred is more controversial.⁶¹ Another reason to examine the colon of patients who have symptoms thought to be of functional origin is to reassure the patient that no serious organic disease is present. In one study, however, patients with IBS who had negative colonoscopy findings did not feel reassured or report a higher health-related quality of life than patients who did not undergo colonoscopy.⁶²

Several studies have shown that there are no differences in colonoscopy findings between

patients with IBS and the general population,^{47,48,51,63,64} but it is of paramount importance to remember that in patients who present with diarrhea or bleeding, organic colonic disease is often found, and a colonoscopy with biopsies is indicated.^{65–67} However, when colonoscopy is performed because of other symptoms, such as abdominal pain or a change in bowel habits, the results do not differ between patients with FBD and a screening population.^{65,68}

Taking the information provided above into consideration, along with the fact that endoscopy can account for 50–75% of the overall costs of the diagnostic work-up for a suspected FBD, colonoscopy should not be performed at the beginning of the diagnostic work-up, but only when a serious organic disease is reasonably likely.⁶⁹ If patients with IBS present with new symptoms, indicating the possibility of an organic lesion, they should, of course, be assessed in the same way as other patients, since they have an equal (but not increased) risk of developing organic colonic lesions over time.⁶³

Abdominal ultrasound

Abdominal ultrasound is often included in the diagnostic work-up of patients for whom there is a clinical suspicion of an FBD.^{59,60} In patients with IBS, the detection of some abnormalities by abdominal ultrasound is not uncommon, but these findings are rarely considered to explain the symptoms or render any additional therapeutic measures.⁶⁴ Thus, routine ultrasound scanning in patients with suspected IBS is normally unnecessary and could even be counterproductive because the detection of many minor abnormalities can pose further therapeutic dilemmas. Taking into consideration that, compared with the general population, patients with IBS also undergo more cholecystectomies and some other surgical procedures,^{70,71} of which some are probably unnecessary, a restrictive attitude in performing investigations that might result in this course of events is recommended.

⁷⁵SeHCAT test

Bile-acid malabsorption is a common finding in patients who have chronic diarrhea.^{66,72} There is also evidence that supports a high prevalence of bile-acid malabsorption in patients with IBS in general (19%)⁷³ and diarrhea-predominant IBS in particular.^{74,75} In patients with chronic diarrheal symptoms, for whom colonoscopy with biopsies is normal, the ⁷⁵SeHCAT test to diagnose

bile-acid malabsorption should be considered.⁶⁶ This test should be considered particularly in patients who have risk factors for bile-acid malabsorption, such as previous cholecystectomy. The clinical relevance of this strategy is supported by the fact that patients with bile-acid malabsorption have a good response to treatment with bile-acid binding agents.⁷² However, the ⁷⁵SeHCAT test is costly and not available in all centers, and a therapeutic trial with a bile-acid binding agent (2–4 weeks) might be considered as an alternative diagnostic strategy, even though this strategy has not been formally validated.

Lactose malabsorption

The usefulness of hydrogen breath testing for the detection of lactose malabsorption among patients with IBS is controversial.⁷⁶ Most studies performed so far have demonstrated a similar prevalence of lactose malabsorption among patients with IBS and in the general population.^{48,51,77,78} There is also no strong relationship between lactose malabsorption and self-reported milk-related symptoms in general in patients with IBS.⁷⁹ In addition, the use of a lactose-free diet in patients with IBS and lactose malabsorption has not been convincingly shown to improve symptoms beyond a placebo effect.^{78,80} Moreover, a specific symptom profile in patients with IBS that is suggestive of lactose malabsorption has been hard to identify.⁷⁷ Hence, routine testing for lactose malabsorption can not be recommended in the clinical work-up of patients with a suspected FBD. However, in select patients such testing can be of clinical value.

Small intestinal bacterial overgrowth

Small intestinal bacterial overgrowth (SIBO), detected using the lactulose hydrogen breath test, has been proposed to be a prevalent condition in patients who have IBS.⁸¹ In support of this finding, a modest reduction in symptoms after treatment with a nonabsorbable antibiotic has been demonstrated.⁸² However, this issue is highly controversial⁸³ and in other studies abnormal breath test results have been obtained with similar frequency in patients with IBS and healthy controls.^{84–86} Moreover, when cultures of jejunal aspirates have been used to diagnose SIBO (the gold standard for diagnosis of SIBO), an equal prevalence of SIBO has been found among patients with IBS and healthy controls,⁸⁴ and no clear correlation has been observed between altered bacterial counts in the small intestine and the symptom pattern. At this stage, widespread use of hydrogen breath testing

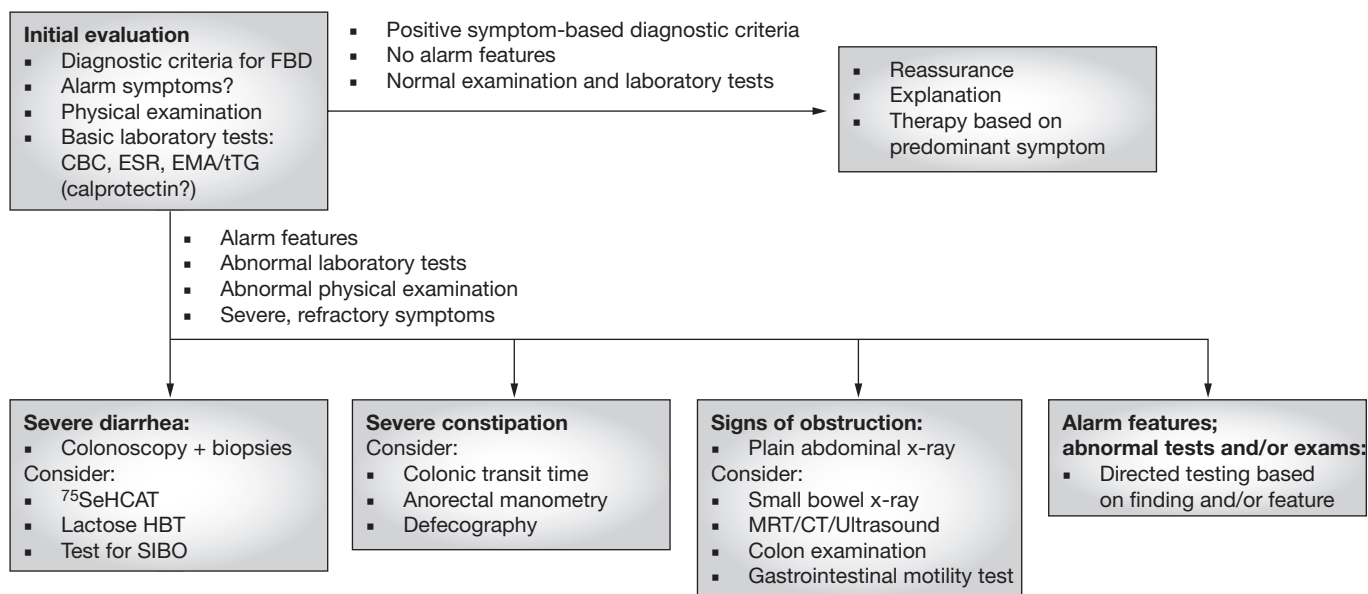


Figure 1 Proposed diagnostic algorithm for use in patients who have suspected functional bowel disorders. For further explanation please see the main text. Abbreviations: CBC, complete blood count; EMA, endomyseal antibody; ESR, erythrocyte sedimentation rate; FBD, functional bowel disorder; HBT, hydrogen breath test; MRT, magnetic resonance tomography; SIBO, small intestinal bacterial overgrowth; tTG, tissue transglutaminase.

for the detection of SIBO is not recommended, as existing data concerning the prevalence of SIBO in patients with IBS are conflicting, and hydrogen breath testing (especially lactulose) for SIBO has poor specificity and sensitivity.⁷⁶ Furthermore, systemic antibiotics should be used with care in patients with FBDs, as worsening of symptoms after use of various antibiotics is common.⁸⁷

Special investigations

Alterations in gastrointestinal motility and visceral hypersensitivity are considered to be major pathophysiological factors in patients with FBDs.^{88,89} On the basis of this fact, it might seem logical to include assessments of these functions in the diagnostic work-up in patients with suspected FBDs (e.g. measurement of colonic transit time, manometry or visceral sensory testing). However, these investigations are mainly to be considered as research tools with few exceptions. In patients who have severe, refractory constipation, studies of colonic and anorectal function may have clinical utility, as specific treatment alternatives could be considered.⁹⁰ In patients who have disabling symptoms that are suggestive of subocclusive episodes, chronic intestinal pseudo-obstruction should be considered. This rare diagnosis relies on the demonstration of radiological signs of intestinal mechanical occlusion, and exclusion

of any organic obstructing lesion,⁹¹ and small intestinal manometry can provide information concerning the underlying pathophysiology in these patients.

Various abnormalities in small bowel motility have also been observed in patients who have IBS, but none is specific and there is also limited evidence for a correlation between motility patterns and symptoms.⁸⁹ Visceral hypersensitivity is a well documented finding in patients with FBDs and its presence strengthens the probability of a functional diagnosis. However, visceral hypersensitivity is not present in all patients, does not exclude the presence of an organic gastrointestinal disease and, so far, does not lead to any specific therapeutic approach.⁹² Measurement of visceral sensitivity could not, therefore, be recommended apart from for scientific purposes.

Patients with IBS often complain of post-prandial worsening of their symptoms. One survey found that 63% of patients with IBS considered that their gastrointestinal symptoms were related to food intake,⁹³ and several lines of evidence suggest that food allergy or generalized immune hypersensitivity might be of importance.⁹⁴ The mechanisms underlying food allergy in these patients could be mediated by IgE and/or IgG antibodies,^{95,96} and preliminary data suggest there is therapeutic potential for

dietary elimination based on the presence of IgG antibodies to food.⁹⁷ On the other hand, there are also studies that have found discrepancies between reported food intolerance and allergy testing in patients with IBS.^{94,98} At this stage, further research is needed before routine allergy testing can be recommended in the clinical work-up of patients with suspected FBDs.

CONCLUSIONS

The implementation of evidence-based facts into clinical practice is obviously not a straightforward process. The diagnostic algorithm for patients with a suspected FBD presented in Figure 1 is to be viewed as a recommendation: it will probably work for some patients, but not for all. Diagnosis of an FBD is based on identifying positive symptom-based criteria, and the exclusion, in a cost-effective manner, of other conditions that have similar clinical presentations.

For most patients presenting with symptoms suggestive of an FBD, taking a detailed clinical history, confirming the presence of positive symptom-based diagnostic criteria and the absence of alarm features (together with a normal physical examination and normal basic laboratory test results) is enough to make a confident diagnosis. It also seems to be important to evaluate the presence of associated extra-intestinal symptoms and psychiatric and/or psychosocial factors, which could guide management and further sharpen diagnostic accuracy.

When everything in the initial evaluation is in concordance with the diagnosis of an FBD, it is of great importance to reassure the patient and give a thorough explanation about what it means to have an FBD. If, thereafter, the patient needs some kind of treatment it should be based on the predominant symptom. However, if alarm features are present, or if the initial evaluation results in abnormal findings, targeted testing is crucial to confirm or exclude an organic cause for the symptoms. The presence of severe, refractory diarrhea should normally lead to consideration of a more-extensive diagnostic work-up than the presence of predominant constipation or alternating bowel habits, since organic differential diagnoses are more prevalent when diarrhea is the dominant symptom (e.g. IBD, microscopic colitis and bile-acid malabsorption). For the few cases in which there are signs of gastrointestinal obstruction, examinations to rule out mechanical obstruction and assessment of gastrointestinal motor function could be considered.

KEY POINTS

- A positive diagnosis of a functional bowel disorder (FBD) should be made using symptom-based diagnostic criteria and the absence of alarm features
- Limited blood testing (e.g. complete blood count, erythrocyte sedimentation rate, measurement of endomyseal antibodies or tissue transglutaminase antibodies) is often useful in the clinical evaluation of patients with suspected FBDs
- Further investigations are normally only needed in the presence of specific symptoms and/or findings
- Extraintestinal symptoms of FBDs are common and seldom need specific investigation
- The diagnosis of an FBD seems to be stable over time, although specific symptoms can vary considerably

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