Sindrom razdražljivega črevesja: ali je učinkovita rešitev še vedno tako nedosegljiva?

Irritable Bowel Syndrome: Is an Effective Solution Still Elusive?

Avtor / Author

Ustanova / Institute

Ana Globočnik[1], Andreja Ocepek[1,2]

[1]Univerzitetni klinični center Maribor, Klinika za interno medicino, Oddelek za gastroenterologijo, Maribor, Slovenija; [2]Univerza v Mariboru, Medicinska fakulteta, Maribor, Slovenija;

[1]University Medical Centre Maribor, University Division of Internal Medicine, Department of Gastroenterology, Maribor, Slovenia; [2]University of Maribor, Faculty of Medicine, Maribor, Slovenia;

Ključne besede:
sindrom razdražljivega črevesja, prehrana, mikrobiota, probiotiki, prebiotiki, Rome IV

Key words:
irritable bowel syndrome, diet, microbiota, probiotics, prebiotics, Rome IV

Članek prispel / Received
28. 8. 2025
Članek sprejet / Accepted
23. 9. 2025

Naslov za dopisovanje / Correspondence
Ana Globočnik, dr. med.,
ana.globocnik356@gmail.com

Izvleček

Sindrom razdražljivega črevesja (SRČ) spada med motnje v interakciji med črevesjem in možgani ter zaradi svoje kompleksne patofiziologije predstavlja diagnostični in terapevtski izziv tako za bolnike kot tudi zdravstvene strokovnjake. K obravnavi bolnika je treba pristopiti postopno – z natančno klinično oceno, izključitvijo alarmnih simptomov in diferencialno diagnostično obravnavo drugih obolenj, kot so kronična vnetna črevesna bolezen, rak debelega črevesa in danke, celiakija, divertikulitis, malabsorbcija ogljikovih hidratov, kronični pankreatitis, nevroendokrini tumorji, hipertiroidizem, bakterijska razrast tankega črevesja in gastrointestinalne okužbe, ki jih je mogoče zdraviti bolj specifično ali uspešnejše. Po potrjeni diagnozi je terapevtski pristop usmerjen v ublažitev glavnih simptomov,

Abstract

Irritable bowel syndrome (IBS) is classified as a disorder of the gut-brain interaction. IBS presents an ongoing challenge for patients and healthcare professionals due to the complexity of the underlying pathophysiology. It is important to approach the patient with IBS in a stepwise manner, beginning with the exclusion of alarming symptoms and other conditions, such as inflammatory bowel disease, colorectal cancer, celiac disease, diverticulitis, carbohydrate malabsorption or maldigestion, chronic pancreatitis, neuroendocrine tumours, hyperthyroidism, small intestinal bacterial overgrowth, bile acid malabsorption or idiopathic bile acid diarrhoea, and gastrointestinal infections, which often have more straightforward or effective treatment. When

https://doi.org/10.18690/actabiomed.289, CC BY 4.0

kot so abdominalna bolečina, napihnjenost ter spremenjena frekvenca in konsistenca blata.
Celostno vodenje bolnika vključuje vzpostavitev trdnega terapevtskega odnosa med zdravnikom in bolnikom, spremembo življenjskega sloga (vključno s telesno vadbo in prehrano), oceno črevesne mikrobiote, uporabo probiotikov, individualno prilagojeno farmakološko terapijo ter psihološke pristope, kot sta psihoterapija in obvladovanje stresa. Kljub mnogim, že dostopnim terapevtskim možnostim, ostaja iskanje optimalne in dolgoročno učinkovite rešitve za SRČ še vedno aktualen izziv.

the diagnosis of IBS is established, the focus is on therapy aimed at alleviating symptoms, such as pain, bloating, and altered bowel habits. Management of IBS includes a strong patient-physician relationship, lifestyle modifications (physical activity and dietary changes), analysing the gut microbiota, using probiotics, pharmacologic therapy, and psychological support, including psychotherapy and stress modulation.

INTRODUCTION

Irritable bowel syndrome (IBS) is classified as a functional gastrointestinal disorder. Notably, the pathophysiology underlying IBS is poorly understood and the treatment outcomes are frequently suboptimal. The most recent Rome IV diagnostic criteria have introduced a revised classification, in which the functional gastrointestinal disorders have been renamed as disorders of the gut–brain interaction. This terminology emphasizes the multidimensional nature of IBS and the necessity of a multidisciplinary approach to management (1).

Epidemiologic data from 2022 estimate that IBS affects between 10% and 23% of the global population (2). IBS affects all age groups with approximately one-half of patients < 35 years of age. Women are disproportionately affected by IBS with higher prevalence rates reported in Asia and Europe. Spontaneous remission of symptoms occurs in 12%–38% of patients. Physicians at all levels of healthcare from general practitioners in primary care to specialists in secondary and tertiary settings increasingly encounter individuals presenting with IBS-related symptoms. Clinical management of IBS is often complex and resource-intensive, involving multiple referrals, imaging studies, and invasive diagnostic procedures. Despite these efforts, therapeutic outcomes for IBS are frequently unsatisfactory (3, 4).

The etiopathogenesis of IBS has not been completely elucidated. Current evidence suggests that IBS most likely arises from an interplay of psychological and environmental factors, which trigger alterations along the gut–brain axis (4).

DEFINITION OF IBS

The Rome IV criteria (2016) remain the standard diagnostic framework for the initial clinical evaluation of patients suspected to have IBS (5). According to these criteria, diagnosing IBS requires recurrent abdominal pain, occurring at least 1 d/w over the past 3 months, accompanied by at least two of the following features:

- improvement of pain after defecation;
- change in stool frequency; and
- change in stool form or consistency (5).

Based on stool characteristics, IBS is further classified into subtypes:

- IBS with predominant constipation (IBS-C), > 25% of bowel movements with Bristol stool form scale (BSFS) types 1 or 2 and < 25% with BSFS types 6 or 7;
- IBS with predominant diarrhoea (IBS-D), > 25% of bowel movements with BSFS types 6 or 7 and < 25% with BSFS types 1 or 2;
- IBS with mixed bowel habits (IBS-M), > 25% of

bowel movements with BSFS types 1 or 2 and > 25% with BSFS types 6 or 7; and
- unclassified IBS (IBS-U), patients who fulfil the diagnostic criteria for IBS but do not meet criteria for any of the defined subtypes (4, 5).

DIAGNOSTIC CONSIDERATIONS AND EXCLUSION OF ORGANIC DISEASE

Urgent conditions and organic causes of symptoms must be excluded before confirming the diagnosis of IBS based on the Rome IV criteria. A thorough medical history is essential to characterize the pattern of abdominal pain, the relationship to defecation, and identify potential alarm features, such as haematochezia or melena, unintentional weight loss (> 10% over the previous 6 months), iron deficiency anaemia, nocturnal symptoms, onset after 50 years of age, or a family history of colorectal cancer or inflammatory bowel disease. The presence of any alarm feature necessitates further diagnostic evaluation, referral to a gastroenterologist, and/or endoscopic investigation (5, 6).

In addition, disorders that mimic IBS should be systematically excluded. In addition, evaluating a patient with suspected IBS should include the following: a review of ongoing and newly introduced medications; serologic testing for celiac disease; assessment for bile acid diarrhoea following cholecystectomy; stool cultures to exclude infectious causes of diarrhoea; and baseline laboratory testing. Only after these possibilities are excluded should the Rome IV criteria be applied to establish a diagnosis of IBS (5, 6).

Routine testing for C-reactive protein, food allergies, carbohydrate malabsorption, or faecal calprotectin is not recommended during the initial diagnostic work-up for IBS (7). Nevertheless, faecal calprotectin (FC) remains an important biomarker of intestinal inflammation in inflammatory bowel disease (IBD) but the results must be interpreted in the context of the overall clinical presentation because levels may also be elevated in other gastrointestinal disorders. Markedly elevated FC values (> 250 µg/g) effectively exclude IBS as the sole underlying pathologic disorder (8).

In cases of refractory symptoms or poor treatment response, additional differential diagnoses should be considered, including defecatory or motility disorders with altered intestinal transit times, carbohydrate malabsorption or maldigestion (e.g., lactose or fructose intolerance), chronic pancreatitis, neuroendocrine tumours, hyperthyroidism, small intestinal bacterial overgrowth (SIBO), bile acid malabsorption, and idiopathic bile acid diarrhoea. The latter disorder is characterized by an increased luminal bile acid concentration, particularly after cholecystectomy, leading to enhanced secretion, permeability, and motility (4,7). In such cases, bile acid sequestrants, such as cholestyramine, may provide significant symptomatic relief (9).

MANAGEMENT STRATEGIES

IBS results from disturbances in bidirectional communication between the brain and the gut. This gut–brain interaction is influenced by multiple factors, including genetics, personality traits, individual stress reactivity, mucosal inflammation, alterations of the intestinal microbiome, and sequelae of bacterial, viral, or parasitic infections (9). Among these, stress reactivity, mucosal inflammation, microbiome composition, and post infectious changes are now considered modifiable, allowing for symptomatic relief and improvement in patients' health-related quality of life.

Patient–physician relationship and lifestyle modification

Successful therapeutic management begins with the establishment of a respectful and empathetic patient–physician relationship. Many patients hold misconceptions and unrealistic expectations regarding their condition and some healthcare providers still believe IBS is a purely psychological or stress-related disorder. Clinical encounters with these patients typically require more time and effort, as well as clear, honest, and supportive communication (10,11).

A first-line intervention should involve discussion

of potential lifestyle modifications, including increased physical activity, dietary adjustments, and avoidance of symptom-triggering foods. Among dietary strategies, the low-FODMAP diet has gained popularity. This approach eliminates foods rich in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols, which exert osmotic effects, undergo fermentation, and promote gas production. Evidence for the efficacy of the FODMAP diet is based primarily on small-scale studies with limited generalizability and short-term outcomes. Nevertheless, many patients report symptomatic improvement with elimination of certain foods, which under the supervision of a clinical dietitian may represent an appropriate starting point for symptom management. Typically, such a diet involves a 3–6-week elimination phase, followed by assessment of response and gradual reintroduction of fermentable carbohydrates (9,10). Other less restrictive dietary approaches have also been studied, such as lactose elimination or the National Institute for Health and Care Excellence (NICE) diet, which recommends smaller, more frequent meals and avoidance of known triggers, including alcohol and caffeine. These strategies have demonstrated efficacy, although generally to a lesser degree than the low-FODMAP diet (3).

Interestingly, pharmaceutical formulations of peppermint oil have shown additional benefits, particularly in reducing bloating and abdominal pain. Enteric-coated capsules allow delivery of peppermint oil to the small and large intestine, and some studies have even demonstrated superior efficacy compared to antispasmodics or other pharmacologic agents for IBS (6,11). Similarly, combining turmeric essential oil with fennel has been reported to provide symptomatic improvement (12).

Soluble dietary fibres also have a beneficial role by improving stool regularity and consistency. However, intake should not exceed the recommended daily allowance for the general population (25–30 g/d). Soluble fibres, such as psyllium, are particularly useful because soluble fibres may improve symptoms of constipation and diarrhoea, while also reducing bloating and flatulence (6,10).

Microbiome, Probiotics, Prebiotics, and Postbiotics

One of the most extensively investigated topics in IBS research focuses on the intestinal microbiome and the potential role of probiotics. Studies involving the gut microbiota in IBS patients have demonstrated reduced microbial diversity, an increased abundance of specific bacterial strains with a concomitant decrease in non-pathogenic commensals, impaired resistance to pathogenic colonization, and altered mast cell activity that affects endocrine and neural signalling, thereby contributing to the pathogenesis underlying IBS (13). Ongoing studies aim to identify bacterial strains consistently associated with IBS but the results have been heterogeneous, reflecting the complexity of the gut ecosystem. To date, only one-third of the gut microbiota has been fully characterized (3). Jacobs et al. (14) recently reported increased abundance of *Bacteroides dorei*, *Actinomyces spp.*, *Streptococcus spp.*, *Eggerthella lenta*, and *Blautia hydrogenotrophica* among IBS patients in a racially and ethnically diverse cohort with reduced levels of *Faecalibacterium prausnitzii*, *Bacteroides thetaiotaomicron*, and *Bilophila wadsworthia* compared to healthy controls.

Other meta-analyses have reported decreased concentrations of *Bifidobacterium*, *Lactobacillus*, *F. prausnitzii*, and *Bacteroidetes* with an increased prevalence of *Firmicutes*, *Escherichia coli*, and *Enterobacter* (3). Altered bacterial metabolism has also been demonstrated, including an enhanced ability to utilize fermentable carbohydrates in IBS patients, which may help explain the clinical effectiveness of the low-FODMAP diet (14).

These variations have fuelled growing interest in the therapeutic use of probiotics. Current evidence suggests that probiotics may be most effective in IBS-D (6). Treatment beyond 12 w is not generally recommended if no symptomatic benefit is observed. The efficacy of probiotic preparations depends largely on strain composition, concentration, and, importantly, diversity; formulations with broader strain diversity are preferred (11).

Prebiotics are non-digestible carbohydrates that promote the growth or activity of beneficial gut bacteria. Examples of prebiotics include

fructooligosaccharides, galactooligosaccharides, and inulin. While IBS patients appear to have reduced intake of prebiotics, clinical data on the effectiveness of supplementation are limited and contradictory. Therefore, the routine use of prebiotics is not currently recommended in clinical guidelines (3,15).

Postbiotics, defined as bioactive compounds produced through microbial metabolism that exert beneficial effects on the host but do not meet the definition of probiotics or prebiotics, are another emerging therapeutic approach (16). Sodium butyrate is commonly used by patients with IBS in Central and Eastern Europe and has been studied as a postbiotic. Butyrate serves as an energy source for enterocytes, exerts anti-inflammatory effects, promotes cell proliferation, and inhibits apoptosis. A clinical study conducted in Slovenia reported significant improvement in the quality of life among IBS patients receiving sodium butyrate supplementation; no adverse effects occurred (17).

Personalized Pharmacologic Treatment

Pharmacologic therapy for patients with IBS is primarily symptom-oriented. Therefore, careful assessment of the predominant symptoms, classification into one of the subtypes (IBS-D, IBS-C, IBS-M, or IBS-U), and subsequent tailored treatment selection are essential (9,10).

Abdominal pain and bloating are often more bothersome in all IBS subtypes than altered bowel habits. These symptoms may be alleviated with antispasmodics (e.g., mebeverine), the gut-targeted antibiotic, rifaximin (rifaximin is only approved in Slovenia by the Hepatology Board [KOGE, University Medical Centre Ljubljana] and used exclusively for another indication), or in select cases, antidepressants. The choice of antidepressant has a significant role in treating IBS. Specifically, tricyclic antidepressants (TCAs) may induce constipation and are therefore preferable in patients with IBS-D, whereas selective serotonin reuptake inhibitors (SSRIs) may induce diarrhoea and are thus more appropriate in patients with IBS-C (9,10). Antidepressants should be considered as a second-line therapy, initiated at low doses (e.g., amitriptyline or doxepin [10 mg]), and gradually titrated to the maximum tolerated dose. Higher doses are associated with an increased risk of adverse effects (11).

Conventional analgesics, such as non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol, or opioids, are generally ineffective in IBS-related pain and may even exacerbate symptoms (11). More promising results have been demonstrated with serotonin receptor modulators, such as alosetron, ramosetron, and ondansetron. Of serotonin receptor modulators, only ondansetron is currently available in Slovenia (4).

Loperamide remains a useful adjunct for diarrhoea-predominant IBS (9). Patients with constipation-predominant symptoms unresponsive to lifestyle modification and non-pharmacologic measures, may benefit from bulk-forming laxatives, such as psyllium, methylcellulose, corn fibre, or calcium polycarbophil, as well as osmotic agents containing polyethylene glycol. Lactulose-based laxatives should be used with caution because lactulose-based laxatives may aggravate bloating and abdominal pain. Other agents with proven efficacy include lubiprostone, linaclotide, tenapanor, and tegaserod, although these agents are not currently available in Slovenia (4,9).

Psychological Impact, Stress, and Psychotherapy

Approximately 44% of patients with IBS have been reported to have anxiety disorders and 25% have a diagnosis of depression. It remains unclear whether psychological processes exert a primary influence on gut function or whether disturbances in gastrointestinal function predispose to psychological co-morbidities; current evidence supports the latter (2). Referral for psychological or psychotherapeutic intervention should be considered in patients with a clear association between stress and IBS symptoms. Studies have demonstrated beneficial effects of various approaches (9). Cognitive–behavioural therapy has shown the greatest efficacy in patients with IBS, while hypnotherapy, dynamic psychotherapy, and relaxation-based interventions have also been associated with symptom improvement (4,10).

CONCLUSION

IBS is a disorder affecting an increasingly large proportion of the population with a corresponding rise in the number of healthcare professionals involved in IBS management. A stepwise approach to the diagnosis and treatment of IBS is recommended to ensure more effective and structured care. Although the clinical course in patients with IBS can often feel frustrating and at times without clear therapeutic solutions, research into the aetiology and treatment of IBS continues to advance. Patience and persistence among IBS patients and healthcare providers are required. Above all, it is essential to recognize that each patient seeks nothing more than meaningful relief of symptoms and an improved quality of life.

REFERENCES

1. Rome Foundation. What is a disorder of gut–brain interaction (DGBI) [Internet]. 2022 [cited 2024 Oct 21].
2. Zhang T, Ma X, Tian W, Zhang J, Wei Y, Zhang B, et al. Global research trends in irritable bowel syndrome: A bibliometric and visualized study. Front Med (Lausanne). 2022;9:922063. doi:10.3389/fmed.2022.922063
3. Shaikh SD, Sun N, Canakis A, Park WY, Weber HC. Irritable bowel syndrome and the gut microbiome: A comprehensive review. J Clin Med. 2023;12(7):2558. doi:10.3390/jcm12072558
4. Štabuc B. Irritable bowel syndrome – the most frequent functional bowel disorder. Slovenian Journal of Gastroenterology. 2024;3:52–61.
5. Rome Foundation. Rome IV criteria [Internet]. 2020 [cited 2024 Oct 21].
6. Hemy AR, Zhu K. Diagnosis and management of irritable bowel syndrome in the primary care setting [Internet]. BC Med J. [cited 2024 Oct 21].
7. Camilleri M, Boeckxstaens G. Irritable bowel syndrome: treatment based on pathophysiology and biomarkers. Gut. 2023;72(3):590–9. doi:10.1136/gutjnl-2022-328515
8. Štabuc B, Ferkolj I, Drobne D, Smrekar N, Pernat Drobež C, Ocepek A, et al. Recommendations for use of faecal calprotectin in patients with inflammatory bowel disease. Slovenian Journal of Gastroenterology. 2019;2:56–69.
9. Farmer AD, Wood E, Ruffle JK. An approach to the care of patients with irritable bowel syndrome. CMAJ. 2020;192(11):E275–82. doi:10.1503/cmaj.190716
10. Ocepek A. Irritable bowel syndrome. In: Drešček M, editor. Current topics in family medicine: depression, dementia, neurology, phytotherapy, pulmonary hypertension, cardiology, rheumatology, practical skills. Ljubljana: Zavod za razvoj družinske medicine; 2019. p. 25–8. (Family Medicine; vol. 17, suppl 1). ISBN: 978-961-6810-54-8. ISSN: 1581-6605.
11. Black CJ, Ford AC. Best management of irritable bowel syndrome. Frontline Gastroenterol. 2021;12(4):303–15. doi:10.1136/flgastro-2019-101298
12. Portincasa P, Bonfrate L, Scribano MLL, Kohn A, Caporaso N, Festi D, et al. Curcumin and fennel essential oil improve symptoms and quality of life in patients with irritable bowel syndrome. J Gastrointestin Liver Dis. 2016;25(2):151–7. doi:10.15403/jgld.2014.1121.252.ccm

13. Chen M, Ruan G, Chen L, Ying S, Li G, Xu F, et al. Neurotransmitter and intestinal interactions: Focus on the microbiota–gut–brain axis in irritable bowel syndrome. Front Endocrinol (Lausanne). 2022;13:817100. doi:10.3389/fendo.2022.817100
14. Jacobs JP, Lagishetty V, Hauer MC, Labus JS, Dong TS, Toma R, et al. Multi-omics profiles of the intestinal microbiome in irritable bowel syndrome and its bowel habit subtypes. Microbiome. 2023;11(1):5. doi:10.1186/s40168-022-01450-5
15. Ford AC, Quigley EMM, Lacy BE, Lembo AJ, Saito YA, Schiller LR, et al. Efficacy of prebiotics, probiotics, and synbiotics in irritable bowel syndrome and chronic idiopathic constipation: systematic review and meta-analysis. Am J Gastroenterol. 2014;109(10):1547–61. doi:10.1038/ajg.2014.202
16. Żółkiewicz J, Marzec A, Ruszczyński M, Feleszko W. Postbiotics – a step beyond pre- and probiotics. Nutrients. 2020;12(8):2189. doi:10.3390/nu12082189
17. Tepeš B. The effect of butyric acid in treatment of patients with irritable bowel syndrome. Slovenian Journal of Gastroenterology. 2014;1:62–8.