

**Research Article**

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Irritable Bowel Syndrome: Pathophysiology, Diagnosis, and Management. A Narrative Review

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***Corresponding author:** Khalid Muhsin Hassan, MBCHB, Higher Diploma in Internal Medicine, Baghdad Teaching Hospital, Medical city, Baghdad, Iraq**Received Date:** February 26, 2024**Published Date:** March 25, 2024**Abstract**

Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder characterized by abdominal pain and changes in bowel habits. This narrative review aims to summarize the current understanding of IBS pathophysiology, diagnosis, and management. A literature search was conducted in PubMed, Scopus, and Web of Science for studies published between 2010-2022 using the terms "irritable bowel syndrome", "pathophysiology", "diagnosis", and "treatment". Relevant articles were reviewed and key findings were synthesized in a narrative format. IBS is a complex, multifactorial condition involving interactions between the gut-brain axis, genetics, infection/inflammation, and psychosocial factors. Diagnosis is based on symptom-based criteria and exclusion of organic disease. Management is individualized and focuses on lifestyle modifications, pharmacotherapy, psychotherapy, and gut-directed hypnotherapy. Further research is still needed to better elucidate IBS pathophysiology and develop more targeted, mechanism-based therapies.

Keywords: Irritable Bowel Syndrome; Abdominal pain; pathophysiology**Introduction**

Irritable bowel syndrome (IBS) is one of the most common functional gastrointestinal disorders worldwide, with a global prevalence estimated between 5-20% [1,2]. IBS is characterized by recurrent abdominal pain associated with changes in bowel habits, such as diarrhea, constipation, or alternating stool patterns [3]. IBS places a substantial burden on individuals and healthcare systems due to reduced quality of life, work productivity losses, and high utilization of healthcare resources [4-6]. Despite its high prevalence and impact, IBS remains poorly understood and challenging to manage in clinical practice [7]. The pathophysiology of IBS is multifactorial and incompletely elucidated but is thought to involve interactions between the gut-brain axis, genetics, infection/inflammation, and psychosocial factors [8-9]. This narrative review aims to summarize the current understanding of IBS

pathophysiology, diagnostic criteria, and management strategies based on the latest literature. By synthesizing key findings from relevant studies, this review seeks to provide clinicians with an up-to-date overview on IBS to aid in diagnosis and management of affected patients.

Methods

A literature search was conducted in PubMed, Scopus, and Web of Science for studies published between 2010-2022 using the terms "irritable bowel syndrome", "pathophysiology", "diagnosis", and "treatment". Only articles published in English were included. Relevant review articles, guidelines, and original research studies were reviewed. The reference lists of identified articles were also reviewed to find additional sources. Information was synthesized in a narrative format focusing on summarizing the current

understanding and major findings regarding IBS pathophysiology, diagnostic criteria, and management strategies.

Results

Pathophysiology of IBS

The pathophysiology of IBS is multifactorial involving interactions between gut sensory and motor function, the brain-gut axis, genetic factors, infection/inflammation, and psychosocial triggers [10,11]. Key pathophysiological mechanisms that have been identified include:

- a. Altered gut motility: Studies have found delayed transit in IBS with constipation (IBS-C) and rapid transit in IBS with diarrhea (IBS-D) [12].
- b. Visceral hypersensitivity: IBS patients have a lower pain threshold in response to gut distension compared to healthy controls, which may contribute to abdominal pain [13,14].
- c. Brain-gut dysregulation: Brain imaging studies have demonstrated altered brain responses in regions involved in pain processing, emotion regulation, and stress response in IBS patients [15,16].
- d. Genetic factors: Family and twin studies indicate a genetic component, with genes related to serotonin signaling and immune function implicated [17].
- e. Infection/inflammation: Post-infectious IBS can develop after bouts of gastroenteritis. Low-grade inflammation has also been found in a subset of IBS patients [18].
- f. Psychosocial triggers: Life stressors and psychiatric comorbidities such as anxiety and depression are associated with worse IBS symptoms [19].

Diagnostic Criteria for IBS

The diagnosis of IBS is made based on the Rome IV criteria, which requires recurrent abdominal pain at least one day per week in the last 3 months that is associated with two or more of the following criteria: 1) related to defecation, 2) associated with a change in frequency of stool, and 3) associated with a change in form (appearance of stool) [4,13]. IBS subtypes (IBS-C, IBS-D, IBS-M) are defined based on the predominant stool pattern. Diagnosis also requires the symptoms to be present for the last 3 months with symptom onset at least 6 months prior. Organic diseases must be excluded through appropriate testing [15].

Management of IBS

The management of IBS is individualized based on symptom severity and IBS subtype. First-line treatment options include lifestyle modifications (diet, stress management), fiber supplementation, antispasmodics, and laxatives/lubricants for constipation or antidiarrheals for diarrhea-predominant IBS [10,15]. Second-line pharmacotherapy includes 5-HT₃/5-HT₄ agonists/antagonists, tricyclic antidepressants, and gabapentin/pregabalin. Psychotherapy (CBT, hypnotherapy), probiotics, and rifaximin can also provide benefit for some patients. In refractory cases, neuromodulators such as serotonin-norepinephrine

reuptake inhibitors may be tried [20]. Surgery is rarely indicated and reserved for severe refractory cases.

Discussion

This narrative review summarized the current understanding of IBS pathophysiology, diagnosis, and management based on the latest literature. Key findings were consistent with previous systematic reviews and clinical guidelines on IBS. The pathophysiology of IBS is multifactorial but appears to involve interactions between alterations in gut motility and sensation, brain-gut dysregulation, genetic and environmental factors, and the influence of psychosocial triggers. Diagnosis relies on the Rome IV criteria and exclusion of organic diseases. Management is individualized but focuses on lifestyle modifications, pharmacotherapy targeting predominant symptoms, and adjunctive therapies such as psychotherapy and probiotics depending on patient profile and needs. Several limitations of the current literature were also identified. The pathophysiology of IBS remains incompletely understood, and more research is still needed to elucidate the complex interplay between biological and psychological mechanisms. There is a lack of reliable biomarkers for diagnosis or stratifying IBS subtypes. Treatment effectiveness varies significantly between individuals, and more targeted, mechanism-based therapies are still lacking. Large, well-designed trials are also required to establish the efficacy of adjunctive therapies such as probiotics and psychotherapy.

Conclusion

In conclusion, this narrative review summarized the current understanding of IBS as a complex, multifactorial functional gastrointestinal disorder characterized by abdominal pain and changes in bowel habits. Key findings regarding pathophysiology, diagnostic criteria, and management strategies were synthesized based on the latest literature. While progress has been made, further research is still warranted to better elucidate the pathophysiology of IBS and develop more targeted, mechanism-based therapies.

Conflict of interest

None.

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