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Review Article

Expert opinion on current issues and challenges in irritable bowel syndrome

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ABSTRACT

Irritable bowel syndrome (IBS) is a widely prevalent functional gastrointestinal disorder characterized by symptoms such as abdominal pain, irregular bowel movements, and bloating, which significantly impact affected individuals' well-being. The increasing prevalence of IBS in India places a substantial burden on clinical practice. Although diagnostic criteria, such as the commonly used Rome IV criteria, have shown reasonable sensitivity, the diagnosis of IBS remains a nuanced and culturally influenced process. This comprehensive review systematically examines current challenges surrounding IBS prevalence, diagnostic intricacies, and the complex pathophysiology involving visceral hypersensitivity. The review highlights the imperative for noninvasive biomarkers to augment diagnostic precision and emphasizes on following a holistic approach to IBS management as advocated by Indian guidelines. This approach integrates dietary modifications, antispasmodic medications, psychological therapy, and yoga, with specific emphasis on tailoring treatments to individual IBS subtypes. Among antispasmodic drugs, pinaverium bromide because of its unique mechanism of action as a calcium channel antagonist within the gastrointestinal tract has shown promise in alleviating IBS symptoms.

Keywords: IBS, Gastrointestinal disorder, Rome criteria, Biomarkers, Antispasmodics, Pinaverium bromide

INTRODUCTION

Irritable bowel syndrome (IBS) is a well-established functional gastrointestinal disorder with characteristic symptoms, including abdominal pain or discomfort, alterations in stool regularity, and bloating. Classified as a functional bowel condition due to the absence of detectable structural or biochemical abnormalities using conventional diagnostic methods, IBS presents a complex clinical profile. Prevalence rates across North America and Europe fluctuate within the range of 10-15%, indicating geographical disparities. Prevalence figures range from 7% in South Asia to as high as 21% in South America.[1] In India, the prevalence of IBS is 15%.[2] A considerable number of individuals experiencing IBS symptoms typically seek consultation with general practitioners, while gastroenterologists manage 30-50% of patients with IBS in outpatient clinics. Gastroenterology specialists exclusively handle patients with more severe manifestations of IBS. These patients demonstrate a spectrum of symptoms with heightened psychosocial challenges.[2] Primary symptoms, such as stomach pain, abnormal stool patterns, and bloating, are more common in those aged 20 to 40 years, with a clear female preponderance. The interplay of age, gender, and symptoms provides fascinating insights into the complex nature of IBS.

IBS imposes significant disease burden on society because of increased morbidity, increased job absenteeism, decreased labor productivity, and significant financial strain, in addition to symptomatology and demographic variances. Importantly, the impact of IBS goes beyond measured results, affecting overall quality of life and decreasing well-being and everyday functioning.[3]

Experts in India have observed a noticeable increase in the prevalence of IBS in recent years. Approximately 35% of

their professional practice is now devoted to managing patients with IBS, and a significant 75% of all patients actively seek medical help for this ailment. This highlights the prevalence of IBS in the Indian population. Considering the scarcity of information on various aspects of IBS and diagnostic challenges in Indian patients, four physical focus group meetings were conducted with 44 expert gastroenterologists across India. Existing evidence and clinical experience with respect to the diagnosis of IBS, concept of visceral hypersensitivity and its importance in managing IBS, current treatment modalities, and the role of antispasmodics were discussed in detail by the experts, and expert opinions were consolidated and finalized after approval by all participants.

A literature search was performed using PubMed and Google Scholar. After screening, 20 suitable articles were identified and reviewed. This review explores the intricate landscape of IBS prevalence, symptoms, societal impact, and impact on overall patient well-being and is based on the summation of the minutes of meeting of the aforementioned regional advisory board meetings along with a collation of evidence-based literature on accurate diagnosis and management of IBS.

DIAGNOSTIC GUIDELINES FOR IBS: INDIAN PATIENT PERSPECTIVE

The diagnostic criteria for IBS have been significantly refined since their first description by Manning et al in 1979.[4] Over time, the Rome I, Rome II, Rome III criteria, and most recently, the Rome IV (2016) criteria have been proposed. This continuous advancement aims to facilitate the achievement of accurate and effective diagnoses.[5]

In individuals with IBS, pain or discomfort should have at least two of the following three characteristics: relief with defecation, association with changes in stool frequency, or a link to changes in stool consistency. The Rome IV diagnostic criteria, require a patient to have recurring abdominal pain or discomfort on at least three days per month for the prior three months. This discomfort should be accompanied by two or more of the following characteristics: improvement with defecation, an onset associated with a change in stool frequency, or an onset associated with a change in stool consistency.[6]

The American College of Gastroenterology (ACG) Task Force defined IBS as stomach pain or discomfort combined with irregular bowel patterns that last for at least three months. Thus, it is important to comprehend the fundamental causes of IBS, especially because more recent pharmacotherapies address the established pathophysiological mechanisms connected to the illness. The Indian Society of Gastroenterology (ISG) constituted a Task Force on IBS in 2003 with the following aims: to study the profile of patients from different parts of the country who report with chronic lower GI symptoms with no alarm symptoms and negative investigations for organic causes; and collect data on bowel patterns among people living in rural and urban communities in India. The survey concluded that abdominal pain or discomfort was frequent but not universal. Importantly, stool frequency was similar irrespective of whether the patients felt having constipation or diarrhea. Most (90%) non-complainant subjects had 1 or 2 stools per day; symptoms complex suggestive of IBS was present in 4.2% of community subjects.[8]

IBS is a complex condition, involving a variety of mechanisms that contribute to its development. These include changes in gastrointestinal movement, heightened sensitivity in the abdomen, reactivity following infection, gut-brain interactions, shifts in gut microbiota, bacterial overgrowth, sensitivity to certain foods, difficulties in absorbing carbohydrates, and inflammation of the intestines. These mechanisms often lead to symptoms such as stomach pain, bloating, diarrhea, and constipation. While traditional medical treatment has primarily focused on addressing these symptoms individually, it often falls short of providing holistic care for the intricate nature of IBS.[7]

Considering the limitations associated with relying on individual symptoms for diagnosing IBS, various criteria involving combinations of symptoms have been proposed. Examples include the Manning criteria, the Kruis symptom score, and the Rome criteria. However, the findings from studies assessing their accuracy have been mixed, with no consistent differences observed in sensitivity or specificity among these criteria.[7]

Rome IV criteria have been found to have a sensitivity of 75%. Individuals meeting the Rome IV criteria exhibited a higher symptom burden and a lower disease-specific health-related quality of life compared with those who did not meet the criteria. Thus, while alternative symptom-based criteria may identify slightly different subpopulations, the Rome II and III criteria demonstrate the highest degree of congruence.[7]

To assess the validity of widely accepted beliefs surrounding IBS, it is important to understanding the significant impact of a person's psychosocial background on their experience of symptoms such as pain, discomfort, and bowel movements. These notions are largely influenced by Western cultures and their cultural norms. To account for these crucial factors, an Asian consensus was also established. The diagnostic criteria in Asian consensus require the presence of at least one of the following symptoms, along with recurrent abdominal pain, bloating, or related discomfort persistent for a minimum of three months: alleviation of symptoms upon defecation, alterations in stool form (utilizing the Bristol stool scale as reference), and changes in stool frequency.[8]

In a multicenter study from India comparing the Manning, Rome I, Rome II, Rome IV, and Asian diagnostic criteria, Ghoshal et al found that: the Manning criteria had highest sensitivity when diagnosing IBS in Indian patients with

functional lower gastrointestinal disorders, among the three Rome criteria, Rome II exhibited the lowest sensitivity, and the newly proposed Asian criteria, although reasonably effective, were less sensitive in comparison to the Manning criteria.[9]

Expert opinion

When discussing the symptoms of IBS, clinicians pointed out two characteristics that are frequently seen in patients from India: flatulence and postprandial urgency. Approximately 54% of Indian patients have bloating, which is a serious problem because clear classification of symptoms in literature yet. The panelists also collectively expressed their perspectives on the difficulties associated with IBS diagnosis. They noted that although the Rome criteria—particularly Rome III—provide more help than Rome IV, they might not always be useful for correctly classifying individuals who are Indian. To improve the accuracy of IBS diagnosis in the Indian setting, the experts stressed the need of combining Manning's criteria with symptom duration.

VISCERAL HYPERSENSITIVITY: UNDERSTANDING THE PATHOPHYSIOLOGY OF PAIN IN IBS

IBS is undeniably complex, and our understanding remains incomplete because of the absence of identifiable pathological abnormalities and clear biomarkers. IBS is influenced by various factors, including genetic, immunological, and psychological components, along with alterations in microbiota composition, changes in visceral sensory perception, and fluctuations in gastrointestinal motility. Dietary variables and alterations in brain-gut axis activity may potentially contribute to the disease. However, the primary trigger for IBS onset among these factors is yet to be identified.[11]

Visceral hypersensitivity is a fundamental characteristic of IBS and underlies the abdominal pain experienced by individuals diagnosed with IBS. Two distinct phenomena are associated with visceral hypersensitivity: hyperalgesia, characterized by an amplified response to stimuli that are typically perceived as painful, and allodynia, denoting the manifestation of pain in response to stimuli normally innocuous. Visceral hypersensitivity can result from a combination of peripheral and central processes. Specialized vagal and spinal afferent neurons function as sentinels at the peripheral level, sensing environmental stimuli and transmitting crucial information to the spinal cord. Subsequently, these sensory impulses undergo intricate processing within the spinal cord before being transmitted to brain regions responsible for tactile perception, as well as cognitive and affective regulation.[3]

Visceral hypersensitivity is regulated at the peripheral level by mechanisms involving immune cells situated within the mucosal wall. These mechanisms induce sensitization of afferent nerves along with an increase in mucosal permeability. At the central level, visceral hypersensitivity is influenced by various factors, including changes in the hormonal brain-gut axis, heightened vigilance directed at intestinal stimuli, and both functional and structural alterations within the brain.[3]

In IBS, visceral hypersensitivity results from a complex interplay of processes. Immune cells, including mast cells and enterochromaffin cells, release mediators that sensitize afferent nerves at the peripheral level. Variables such as increased mucosal permeability, alterations in intestinal microbiota, and dietary patterns all contribute to this hypersensitivity. Additionally, mediators such as ATP and bradykinin, along with receptors and channels like transient receptor potential (TRP) channels (specifically TRPV1, TRPV4, and TRPA1), play a role in visceral sensations and pain. Furthermore, changes in the hormonal brain-gut axis, heightened attention to intestinal cues, and functional and anatomical alterations in the brain contribute to visceral hypersensitivity. Dysregulation in pain modulation within the central nervous system exacerbates the condition.[3]

Expert opinion

The advisory board panelists recommended a more in-depth exploration of peripheral sensitization, specifically examining potential correlations between headaches and abdominal pathologies. Secondly, experts reached a consensus regarding post-infectious IBS, identifying *Clostridium difficile* as the most well-known cause to date. Notably, experts also emphasized the increasing relevance of post-COVID infections in IBS cases, underscoring the significance of considering a patient's COVID history when evaluating IBS. Additionally, various objective and subjective tests for evaluating the altered gut-brain axis were recommended. These tests include functional magnetic resonance imaging, positron emission tomography, evoked potential test, magnetoencephalography, nociceptive flexion reflex (RIII reflex), cardiac baroreflex, and cardiac vagal tone. Lastly, experts collectively suggested that the alteration of the gut-brain axis plays a substantial role in causing visceral pain among patients.

NOVEL DIAGNOSTIC MODALITIES: ROLE OF BIOMARKERS

IBS comprises various subtypes, including diarrhea-predominant (IBS-D), constipation-predominant (IBS-C), mixed type (IBS-M), and undetermined IBS, with symptoms exhibiting temporal variability. Despite the absence of associations with severe diseases or elevated mortality, patients with IBS frequently need to undergo invasive diagnostic procedures because of the intricate and overlapping nature of their symptoms with organic conditions that necessitate early detection. This excessive reliance on invasive testing imposes substantial psychological, social, and economic burdens on individuals, resulting in increased medication usage, elevated work absenteeism, diminished work efficiency,

and more frequent hospitalizations. Thus, there is an urgent need for noninvasive biomarkers with enhanced diagnostic precision and cost-efficiency.[12]

C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), cortisol, chromogranins, and proinflammatory cytokines are among the serum biomarkers being studied for their potential as diagnostic tools for IBS. However, these biomarkers lack the necessary specificity for IBS and often represent broader inflammatory processes or endocrine activity. Several studies have identified elevated levels of high-sensitivity CRP (hs-CRP) in patients with IBS, but the clinical importance of these findings is unknown. Similarly, ESR is suggested as a non-specific biomarker of microinflammation and requires further investigation for diagnostic use. Stress, a recognized risk factor for IBS, may alter cortisol levels, though the specific involvement of chromogranins in inflammation and IBS remains unknown. Additionally, promising fecal biomarkers like calprotectin and human defensin-2 have emerged. Fecal calprotectin can differentiate between IBS and inflammatory bowel disease (IBD). Finally, the evolving field of proteomics is seen as a promising avenue for discovering new biomarkers. Given the intricate nature of IBS pathophysiology and the substantial psychological, social, and economic challenges it poses for affected individuals, the discussion underscores the urgent need for reliable, noninvasive biomarkers in IBS diagnosis.[13]

Anti-CdtB and anti-vinculin antibodies, two second-generation biomarkers for IBS, are used to distinguish patients with IBS-D from those with IBD. These biomarkers do have some significant drawbacks though. First, epitope instability may occur in anti-CdtB and anti-vinculin antibodies, which might compromise test accuracy. Additionally, sensitivities of anti-CdtB and anti-vinculin antibodies are 43.0% and 52.2%, respectively, which are somewhat poor in differentiating between IBS-D and IBD. This suggests that a sizable fraction of people with IBS-D could have false-negative results with these tests.

Moreover, additional research is required to determine the practicality and cost-effectiveness of these biomarkers in gastroenterology and primary care settings as they may not yet be widely accessible for clinical usage.[15]

Urinary probes, such as sucrose (Su), lactulose (La), and mannitol (Ma), were used by Linsalata et al to measure small-intestinal permeability (s-IP) in patients with celiac disease (CD) and diarrhea-predominant irritable bowel syndrome (IBS-D). Significant differences in gut barrier function were found when probe levels from patients with IBS-D and CD and healthy controls (HCs) were compared. La/Ma ratios were significantly different in patients with IBS-D when compared to those with CD and HCs, suggesting possible changes in s-IP in IBS-D. This noninvasive probe method, in particular the measurement of the La/Ma ratio, offers a useful way to more fully characterize heterogeneous D-IBS population. Additionally, based on s-IP changes, these noninvasive probes may be useful indicators for assessing and distinguishing IBS-D subtype from other subtypes.[14]

In the same study, intestinal fatty acid binding protein (I-FABP) and diamine oxidase (DAO) were evaluated as potential biomarkers for the integrity of the gastrointestinal barrier in patients with IBS-D. Serum I-FABP is a sensitive marker for detecting damage to the intestinal epithelium and enterocyte membrane disintegration. On the other hand, DAO, an intracellular enzyme, is considered an indicator of intestinal epithelial integrity, with elevated serum levels suggesting damage and loss of barrier function within the intestine. Patients with IBS-D who have increased s-IP exhibited higher levels of both I-FABP and DAO. Thus, measuring I-FABP and DAO can help assess integrity of the intestinal epithelium and unravel the pathogenesis of IBS-D.[14]

Expert opinion

The expert panel offered the following recommendations for IBS diagnosis in India.

Current diagnostic markers like complete blood count, CRP, and ESR are not commonly utilized in Indian clinical practice. Fecal calprotectin may be useful for excluding certain diagnoses, but further research is needed.

To evaluate bowel movements, utilizing the Bristol stool form scale in conjunction with assessment of symptoms such as straining, incomplete evacuation, urgency, and patient-reported bowel patterns may be helpful.

Vitamin D deficiency is prevalent in India, but diagnosis cannot be solely based on its levels.

Currently, sucrose, lactulose, and mannitol probes are not in use in Indian clinical practice.

IBS is recognized as a biopsychosocial disorder stemming from various factors, and there is no unique physiological mechanism identified.

In the Indian clinical setting, predominant symptoms include bloating and pain, with factors such as mucosal inflammation, mast cells, T lymphocytes, and enterochromaffin cells playing a role.

CURRENT MANAGEMENT PRACTICES

The Indian Neurogastroenterology and Motility Association (INMA) has developed evidence-based practice guidelines for IBS management. These comprehensive guidelines encompass diagnostic criteria, epidemiology, etiopathogenesis, comorbidities, investigative approaches, lifestyle modifications, and various treatment modalities.[15]

The initial approach to IBS care is symptom-based, with an emphasis on symptom relief and improving patients' quality of life. Pharmacotherapies for IBS management include antispasmodics, bulking agents, antidiarrheals, and promotility agents. Use of a low- fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAP) diet is also advised. Lifestyle changes that include counseling, reassurance, and the promotion of physical activities such as yoga and meditation are also very important. Melatonin has demonstrated effectiveness in decreasing sleep dysfunction, and it is important to identify and treat sleep problems. Although a low-FODMAP diet has shown to be beneficial, more research is needed to determine its effectiveness and applicability in the context of India. A multimodal, multidisciplinary strategy involving consultation with dieticians, gastroenterologists, and psychologists may be more effective than standard therapeutic methods. Patient education and counseling are critical in ensuring adherence to lifestyle changes and dietary practices.[15]

Popular IBS-D medications such as loperamide and diphenoxylate treat diarrhea but provide little relief from stomach pain or distension. Ramosetron and visceral neuromodulators with anticholinergic effects, such as amitriptyline, show potential in the treatment of IBS-D. Patients with IBS can effectively treat gut discomfort with visceral neuromodulators, even if they do not have significant psychiatric comorbidities. Furthermore, non-pharmacological psychological therapies and activities such as yoga have been shown to improve both IBS symptoms and general quality of life.[15]

Antispasmodics in IBS

Antispasmodic drugs are effective in controlling IBS symptoms as they target major components in IBS pathophysiology such as impaired intestinal motility and visceral hypersensitivity. The spasmolytic drug alverine citrate is known to reduce the susceptibility of smooth muscle contractile proteins to calcium while acting as a selective 5-HT1A receptor antagonist. In a placebo-controlled study, alverine citrate was found to be efficacious in alleviating stomach pain and discomfort, particularly when combined with simethicone.[16]

Mebeverine, another widely recognized antispasmodic, functions as a musculotropic agent by decreasing intestinal peristalsis. While earlier non-placebo-controlled trials suggesting a positive impact on managing IBS symptoms, recent placebo-controlled studies have not demonstrated its superiority over placebo.[16]

Otilonium bromide and pinaverium bromide are L-type calcium channel blockers with localized activity in the gastrointestinal tract that have shown promising effects in placebo-controlled trials involving patients with IBS.[16]

Non-specific antispasmodics such as phloroglucinol and trimethylphloroglucinol have been shown in placebo-controlled trials to be beneficial in lowering discomfort in people with IBS.[16]

Antispasmodics with high safety profiles, such as alverine citrate, mebeverine, otilonium bromide, pinaverium bromide, phloroglucinol, and trimethylphloroglucinol, are widely used in the treatment of IBS. These medications continue to play an important role in IBS therapy, providing patients with safe and effective therapeutic choices.[16]

Pinaverium bromide: Role in management of IBS symptoms

Pinaverium bromide has gastrointestinal selectivity and primarily functioning as a calcium channel antagonist. It acts as a highly selective spasmolytic within the gastrointestinal tract and alleviates anxiety and abdominal pain prevalent in functional intestinal diseases, particularly IBS.[17] By blocking L-type voltage-dependent calcium channels in the gastrointestinal tract, it allows for precise control over smooth muscle activity. This inhibition decreases the influx of calcium ions into the smooth muscle cells of the intestinal walls, mitigating the hyperactivity associated with gastrointestinal illnesses such as IBS. Furthermore, pinaverium inhibits the contractile effects of digestive hormones and inflammatory mediators. Notably, it diminishes the impact of cholecystokinin, gastrin, and substance P, all of which regulate the contraction of intestinal smooth muscles, thereby providing relief from discomfort and pain.[17]

In a review and meta-analysis by Bor et al assessing the efficacy of pinaverium bromide in IBS, pinaverium bromide was found to be superior to placebo in alleviating IBS symptoms, specifically abdominal pain, stool changes, and bloating. In this meta-analysis involving 80 distinct study populations with a total of 260,960 subjects, the comprehensive IBS prevalence rate was found to be 11.2%, with elevated rates among females and individuals aged <50 years.[17]

While pinaverium bromide is commonly utilized as an antispasmodic for IBS, there is a scarcity of original clinical research substantiating its efficacy. Current research is limited, with only a few distinctive clinical trials conducted in Europe, Latin America, and Asia, all featuring small sample sizes ranging from 19 to 53 IBS patients. These trials often exhibited incomplete assessments of the efficacy of pinaverium and inadequately addressed issues related to safety and tolerability. Although the ACG guidelines acknowledged that pinaverium might offer short-term relief from gastrointestinal discomfort based on limited evidence, they underscored the insufficiency of data regarding its safety and tolerability.[18]

Zheng et al conducted a multicenter, randomized, controlled trial to assess the effectiveness and safety of pinaverium bromide in alleviating IBS symptoms. Primary

endpoints included reductions in abdominal pain and Bristol stool score, while secondary endpoints were reductions in pain and stool frequencies, abdominal discomfort and its frequency, changes in IBS global symptom scores, and the incidence of adverse effects. A significantly higher proportion of patients treated with pinaverium achieved the primary endpoints compared with those receiving placebo ($p<0.001$). Pinaverium showed significant effectiveness versus placebo for at least one secondary endpoint ($p<001$). Furthermore, as compared to the placebo group, 60% of patients receiving pinaverium reported improvements in their IBS symptoms ($p<001$), and administration of pinaverium did not result in serious side effects.[18]

Jayanthi et al conducted an 8-week, prospective, randomized, open-label study involving 61 IBS-patients in which patients were administered 50 mg pinaverium tablet thrice daily, following breakfast, lunch, and dinner. Efficacy was assessed using a 4-point scale for individual symptoms, where grade I denoted mild symptoms, grade II denoted moderate symptoms, grade III denoted severe symptoms, and grade IV denoted incapacitating symptoms. Pinaverium bromide demonstrated efficacy in alleviating abdominal discomfort and pain as well as improving bowel symptoms in the majority of patients. Specifically, abdominal pain relief was observed in 49% of patients, while 74% experienced improved stool consistency, and 71% reported reduced straining and urgency. Additionally, 64% of patients noted a decrease in mucus-related symptoms. Overall, patients exhibited good tolerance to the administered drug, and only a few minor side effects were reported during the study.[19]

In a recent study, Zheng et al evaluated the post-treatment therapeutic effects (PTTE) of pinaverium in patients with IBS to assess its long-term care benefits. The primary goals were stomach pain and stool consistency, whereas the secondary endpoints were pain and stool frequency. Tertiary endpoints assessed overall symptom improvement as well as adverse events. As compared to placebo group, symptom rebound was observed in significantly lower proportion of patients treated with pinaverium ($p<0.015$). The length of PTTE ranged from 9 to 17 weeks, which is consistent with other antispasmodics.

At 17 weeks, no statistically significant differences between pinaverium and placebo were observed, suggesting a natural evolution of IBS symptoms in approximately 51.5% to 56.4% of patients. These findings underscore the importance of evaluating the efficacy of treatment and PTTE when selecting medications for refractory IBS.[20]

Expert opinion

Expert panelists shared the following perspectives on the use of antispasmodic drugs and pinaverium in India.

Distinct antispasmodic agents, such as pinaverium and otilonium, are recommended for particular IBS subtypes to manage alternating pain and diarrhea.

In certain patients, there remains a need for additional anti-anxiety drugs, as well as the control of visceral sensation.

Antispasmodic medications, including pinaverium, otilonium, and mebeverine, were deemed to possess a low incidence of side effects and demonstrated safety for use.

Potential amalgamations of antispasmodics with probiotics or antibiotics may be tailored to specific IBS subtypes.

Pinaverium is considered for constipation-predominant IBS with pain, but there is a preference for mebeverine in IBS-D.

Prospective research should encompass an evaluation of the enduring effectiveness of pinaverium and its viability as a primary intervention in emergency situations.

CONCLUSION

IBS is a widespread functional gastrointestinal disorder characterized by symptoms such as abdominal pain, irregularities in stool patterns, and bloating. Its global prevalence ranges from 10% to 15%, with variations across regions. The prevalence of IBS is on the rise in India, contributing significantly to clinical caseloads. IBS exerts ramifications beyond physical manifestations, impacting work productivity, overall well-being, and quality of life.

Over the years, diagnostic criteria for IBS have evolved. The Rome IV criteria exhibit reasonable sensitivity in diagnosing IBS. However, the complexity of IBS diagnosis persists, influenced by sociocultural norms. Notably, Asian diagnostic criteria underscore symptoms such as abdominal pain, bloating, and stool irregularities.

Visceral hypersensitivity represents a hallmark of IBS, marked by hyperalgesia and allodynia, originating from complex processes involving both peripheral and central mechanisms. The medical community is increasingly concerned about post-infectious IBS, especially IBS associated with post-COVID infections. Objective tests and the investigation of the gut-brain axis have become pivotal in the diagnosis of IBS. The pursuit of noninvasive biomarkers is imperative for precise IBS diagnosis because of symptom overlap observed with other gastrointestinal conditions. Fecal calprotectin, human-defensin-2, and urinary probes designed to evaluate small intestinal permeability are promising diagnostic tools. The management of IBS, aligned with Indian guidelines, necessitates a comprehensive approach encompassing dietary modifications, antispasmodics, psychological therapy, and physical activities such as yoga. Individualized drugs for various IBS subtypes are

indicated, while psychosocial therapy and yoga have shown usefulness in relieving symptoms and improving overall quality of life for those with IBS.

Antispasmodic drugs such as alverine citrate, mebeverine, otilonium bromide, pinaverium bromide, phloroglucinol, and trimethylphloroglucinol are widely used because of their favorable safety profiles. Among these options, pinaverium Bromide distinguishes itself as a calcium channel antagonist with a distinctive mechanism of action within the gastrointestinal tract. Existing evidence suggests its efficacy in relieving various IBS symptoms, particularly abdominal pain, changes in stool patterns, and bloating. Nevertheless, additional investigation via extensive, placebo-controlled trials is imperative to definitively establish its safety and efficacy.

In conclusion, IBS represents a complex disorder with significant consequences. Advances in diagnostic criteria, understanding visceral hypersensitivity, and identifying noninvasive biomarkers are imperative for improved patient care. The management of IBS necessitates a comprehensive approach, with antispasmodics such as pinaverium bromide showing promise but demanding rigorous safety validation via robust research. Despite the persistent challenges associated with IBS, ongoing research endeavors instill optimism for improved diagnosis and management strategies in the future.

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