Diagnostic strategy of irritable bowel syndrome: a low- and middle-income country perspective

Amal Arifi Hidayat¹, Langgeng Agung Waskito²,³, Titong Sugihartono¹, Hafeza Aftab⁵, Yudith Annisa Ayu Rezkitha³,⁶, Ratha-korn Vilachone⁴,⁷, Muhammad Miftahussurur³,⁴

Departments of ¹Internal Medicine and ²Physiology and Biochemistry, Faculty of Medicine, Universitas Airlangga, Surabaya; ³Helicobacter pylori and Microbiota Study Group, Institute Tropical Disease, Universitas Airlangga, Surabaya; ⁴Division of Gastroentero-Hepatology, Department of Internal Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia; ⁵Department of Gastroenterology, Dhaka Medical College and Hospital, Dhaka, Bangladesh; ⁶Department of Internal Medicine, Universitas Muhammadiyah Surabaya, Surabaya, Indonesia; ⁷Center of Excellence in Digestive Diseases and Gastroenterology Unit, Department of Medicine, Thammasat University, Pathumthani, Thailand

Irritable bowel syndrome (IBS) is a highly prevalent gastrointestinal disorder associated with substantial impairment which considerably burdens healthcare systems worldwide. Research on IBS has largely been conducted in high-income countries posing barriers to the application of diagnostic strategies in low- and middle-income countries (LMICs) due to differences in disease characteristics, healthcare resources, and socioeconomic factors. This review discusses the diagnostic issues associated with LMICs. We present a concise overview of the relevant approaches and propose a diagnostic strategy based on the latest evidence. A positive diagnostic strategy that relies on appropriate symptom-based criteria is crucial within the diagnostic framework. A combination of complete blood count, fecal occult blood test, and complete stool test may reliably identify individuals with suspected IBS who are more likely to have organic diseases, thus justifying the necessity for a colonoscopy. Eventually, we developed a diagnostic algorithm based on a limited setting perspective that summarizes the available evidence and may be applied in LMICs. (Intest Res, Published online)

Key Words: Irritable bowel syndrome; Diagnosis; Developing countries; Human and disease

INTRODUCTION

Irritable bowel syndrome (IBS) is one of the most prevalent and well-known disorders of gut-brain interactions (previously called functional gastrointestinal disorders) worldwide. By applying the Rome III criteria, the global prevalence of IBS was estimated to be 9.2%. In comparison, the prevalence of IBS was reported to be 3.8% based on the Rome IV criteria.¹ Prevalence rates varied significantly between regions, with rates as high as 17.5% in Latin America, 9.6% in Asia, 7.1% in North America, Europe, Australia, and New Zealand, as well as 5.5% in the Middle East and Africa.² This data suggests that the prevalence of IBS tends to be higher in low- and middle-income countries (LMICs) than in high-income countries (HICs). Individual countries, such as Nigeria (33%)³ and Mexico (35.5%),¹ have considerably higher IBS prevalence than the regional average. Since developing countries tend to adopt a more Westernized diet and lifestyle, which may be associated with a higher risk of IBS, the prevalence of IBS may continue to rise.⁵
IBS accounts for 15% of primary care referrals to gastroenterologists and imposes a substantial burden on the healthcare system. Excluding prescriptions and over-the-counter medications, the direct medical costs associated with IBS in the United States are estimated to be as high as $1.5–10 billion annually. The large expense of IBS is mainly due to excessive healthcare resource utilization, testing that is often unnecessary or performed too frequently, and wide variation in regional testing and treatment. A cost-analysis study conducted in Iran, a representative of LMICs, reported that the annual cost per patient for IBS was approximately $90. Besides its economic burden, IBS symptoms have a significant impact on the quality of life of patients. IBS patients have been demonstrated to have a lower quality of life than that of healthy individuals, which correlates significantly with symptom severity. Additionally, patients with IBS report being less spontaneous because of their unpredictable symptoms. Moreover, they are stigmatized by family, friends, and even their own physicians, who may not fully understand the substantial daily-living implications of their symptoms. An instantaneous cure was valued more than a longer lifespan by IBS patients, as reported by a study. Individuals with IBS would be even willing to take on a 1% risk of sudden death if a hypothetical drug could treat their illness. Patients with IBS often have trouble focusing at work because of their symptoms, so they may take more time off, which is called absenteeism. Additionally, they struggle to achieve their best performance, a concept called presenteeism. In terms of decreased work productivity, the indirect costs of absenteeism and presenteeism are significant and comparable to those of other chronic diseases. Absenteeism costs employers an average of $901 per employee with IBS versus $528 per employee without IBS annually. Moreover, patients who are unable to work due to IBS symptoms and claim sickness may incur additional costs to society.

The majority of IBS research has been conducted in North America and Europe, with far fewer studies conducted in and relevant to LMICs. Inadequate progress has been made in closing the gap between the generation and application of IBS knowledge in LMICs, particularly in diagnostic strategies, in which a number of challenges have arisen. The diagnostic strategies applied in Western countries are frequently irrelevant in LMICs because of differences in disease characteristics, healthcare resources, socioeconomic factors, and biological diversity among ethnic groups. Research on health systems is highly context-dependent, as resources, facilities, and socio-cultural values vary substantially between HICs and LMICs and even within countries. This review focuses on the diagnostic challenges faced by LMIC. We provide a summary of relevant strategies and suggest a diagnostic approach based on the latest evidence from an LMIC perspective.

**DIAGNOSING IBS: EXCLUSION VS. POSITIVE DIAGNOSTIC STRATEGY**

Despite its high prevalence, an accurate diagnosis of IBS remains challenging. Due to a lack of reliable biological markers for IBS, clinicians may depend heavily on patient symptoms when establishing the diagnosis. IBS symptoms are generally difficult to objectively evaluate and may vary among patients. Additionally, a variety of organic gastrointestinal disorders can mimic IBS. Clinicians and patients are typically concerned about overlooking other possible diagnoses, such as inflammatory bowel disease, microscopic colitis, infectious colitis, celiac disease, and colon cancer. Owing to this uncertainty, many practitioners approach IBS as a diagnosis of exclusion by performing a considerable number of unnecessary, expensive, and invasive tests. According to a survey, 72% of community providers endorsed IBS as an exclusionary criterion. This perspective was also shared by 42% of gastroenterologists, 76% of general internal medicine practitioners, and 8% of IBS experts. The dilemma for providers that there is no endpoint for establishing a positive diagnostic entity is not considered in the strategy of exclusion. This paradigm delays the initiation of the appropriate IBS treatment. On average, it takes 4 years for a patient to receive an accurate diagnosis of IBS. The stigma associated with an IBS diagnosis can leave many patients believing that their physicians may not treat them seriously and that they are unable to access effective treatment. Furthermore, it has been revealed that providers who believe IBS to be an exclusionary diagnosis are likely to order 1.6 more tests and spend $364 more than are those who do not. To our knowledge, no single LMIC has published a similar survey or report on the direct cost of diagnosing IBS using an exclusionary approach yet.

Despite the lack of a validated definition, a positive diagnostic strategy entails acquiring a detailed history, performing careful physical examinations, and applying a standard definition along with limited diagnostic tests to establish an accurate diagnosis of IBS. A study conducted in a primary care setting compared a positive diagnosis strategy to an exclusion strategy and found that neither was inferior in terms of health-
related quality of life. There were no differences in gastrointestinal symptoms or patient satisfaction between the 2 groups; however, the positive diagnosis group had nearly 40% lower overall healthcare costs ($5,075 per year vs. $3,160 per year). No cases of inflammatory bowel disease, celiac disease, or malignancy were identified using a diagnostic approach, indicating the cost-effectiveness of the positive strategy. Furthermore, a provider who delivers a convincingly positive diagnosis of IBS with limited testing is more likely to shorten the time to treatment initiation by involving the patient in a joint decision. The American Gastroenterology College (ACG) recommends initiating empiric treatment as soon as possible to further reduce unnecessary diagnostic tests despite the low quality of data supporting this practice.

The positive diagnostic strategy for IBS is largely based on symptom-based criteria. Although its complete pathophysiology has not yet been elucidated, IBS is widely accepted as a real medical disorder. Therefore, it is acceptable to employ positive symptom criteria to identify patients with this condition. This approach has been widely applied in psychiatry, where diagnostic entities (e.g., post-traumatic stress disorder or anorexia nervosa) have been established using symptom-based criteria that are true across clinical studies and cultures. In the 1970s, Manning et al. initiated the first attempt to establish a diagnostic criteria for IBS. Patients with abdominal pain who were subsequently confirmed to have or not have organic disease were compared to develop the Manning criteria. Over the past three decades, the Rome Foundation has generated and updated the diagnostic criteria for IBS with the help of local experts. The Rome symptom criteria were first developed in the 1990s and have been updated 3 times, most recently in 2016 with the Rome IV criteria. Although these criteria provide a positive diagnosis, they are unwieldy and unreliable. Up to 8.6% of patients who fulfill the clinically defined criteria for IBS turn out to have celiac disease, inflammatory bowel disease, or colorectal cancer (CRC). Furthermore, recent meta-analyses have revealed that the prevalence of various non-malignant treatable organic gastrointestinal disorders in patients meeting the IBS symptom criteria is significantly higher than that in healthy individuals. In patients with typical IBS symptoms, the prevalence of bile acid diarrhea, lactose malabsorption, fructose malabsorption, microscopic colitis, pancreatic exocrine insufficiency, and small intestinal bacterial overgrowth with lactulose and glucose were 41%, 54%, 43%, 3%, 4.6%, 49%, and 19%, respectively. Therefore, effective treatment is not possible if these disorders are not excluded.

IDENTIFICATION OF THE MOST SUITABLE SYMPTOM CRITERIA

1. Key Features of IBS Symptom Criteria

The Rome criteria are the most universally endorsed diagnostic criteria for defining IBS worldwide. Compared to the previous version, Rome III utilized more evidence-based data rather than consensus-based data. Rome IV, the most recent revision, published in May 2016, is a compilation of scientific evidence that has accumulated since Rome III was released a decade ago. Due to its ambiguity, the term "discomfort" was removed from Rome IV. Discomfort refers to an uncomfortable, but not painful sensation. However, the perceptions of discomfort in patients varied widely, with some equating it with mild pain and others associating it with symptoms like urgency or bloating. Abdominal pain is required at least once per week on average in Rome IV, up from the lower threshold

Table 1: Comparison of the Manning, Asian, Rome III, and Rome IV Criteria for Irritable Bowel Syndrome

<table>
<thead>
<tr>
<th>Manning</th>
<th>Asian</th>
<th>Rome III</th>
<th>Rome IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 4 of these following:</td>
<td>Recurrent abdominal pain, bloating, or other discomfort for ≥ 3 months associated with ≥ 1 of the following:</td>
<td>Recurrent abdominal pain, on average, at least 1 day per week in the last 3 months, associated with ≥ 2 of the following:</td>
<td>Recurrent abdominal pain, on average, at least 1 day per week in the last 3 months, associated with ≥ 2 of the following:</td>
</tr>
<tr>
<td>- Abdominal pain that is eased after bowel movement</td>
<td>- Relief with defecation</td>
<td>- Related to defecation</td>
<td></td>
</tr>
<tr>
<td>- Looser stools at onset of pain</td>
<td>- Change in stool form</td>
<td>- Associated with a change in the frequency of stool</td>
<td></td>
</tr>
<tr>
<td>- More frequent bowel movement at onset of pain</td>
<td>- Change in stool frequency</td>
<td>- Associated with a change in the form or appearance of stool</td>
<td></td>
</tr>
<tr>
<td>- Feeling of incomplete emptying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mucus per rectum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Feeling of distention</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis
of 3 times per month in Rome III. Rome IV has a less specific temporal association with abdominal pain, defecation, and stool characteristics. In contrast to Rome III, which requires that abdominal pain be alleviated after defecation, Rome IV only requires that pain occur either before, during, or shortly after defecation. Additionally, while Rome III requires that a change in stool frequency or consistency follows the onset of abdominal pain, Rome IV merely requires that the two occur simultaneously (Table 1).  

A recent study conducted in the UK Kingdom demonstrated that Rome IV was more specific than Rome III was for the diagnosis of IBS. The positive likelihood ratio of Rome IV was 4.82 compared to 2.45 for Rome III, although its clinical relevance remains unclear. This study also found that patients with constipation (IBS-C) or mixed bowel habits (IBS-M) were more accurately diagnosed using the Rome IV criteria than were those with predominant diarrhea (IBS-D). 42 IBS is also characterized by the relapsing and remitting nature of its symptoms. In population-based studies, the proportion of patients reporting symptom resolution ranged between 17% and 55%. The transition between IBS subtypes in the same individual appears to be significant and is not solely associated with medication. 43,44 The comparison of symptom stability between Rome IV and Rome III in patients with IBS has been investigated in a recent study. At 12 months follow-up, 29.4% of patients meeting the Rome IV criteria for IBS at baseline had shifted to another functional bowel disorder. The percentage of patients who later transitioned to a different functional bowel disorder was lower (16.5%) among those who initially met Rome III criteria. This result indicates that Rome IV is less stable than Rome III. 44

2. Implementing Symptom Criteria of IBS in LMICs
According to the Rome IV criteria, IBS is characterized by abdominal pain related to bowel movements. 29 However, problems may arise when applying these criteria to LMICs, which are largely non-Western countries, as they are developed based on Western studies and clinical experience. The Rome criteria have also been adopted as the standard for determining the eligibility for IBS clinical trials. Although this method reduces bias by recruiting a more homogeneous trial population and facilitating comparisons between trials, it may limit the applicability of the findings to non-Western populations. In India, general practitioners are unfamiliar with the Rome criteria, and many gastroenterologists assume that these criteria may not be suitable as 30% of IBS patients demonstrate neither pain nor discomfort. 45 A multicenter study involving 1,618 subjects diagnosed with IBS using 5 symptom-based criteria. The research group discovered that the Manning criteria had the highest sensitivity (91.2%), followed by the Asian criteria (74.5%), Rome I (67.9%), Rome III (52.5%), and Rome II (40.1%) criteria. 46 One possible explanation for these discrepancies is that abdominal pain was not required for IBS diagnosis using either the Manning or Asian criteria (Table 1). Abdominal bloating was considered along with abdominal pain or discomfort according to the Asian criteria. 46 Similar data have been reported in Romania, where 60% of patients with IBS rated bloating as their most troublesome symptom. 47 According to studies conducted in India and Bangladesh, the frequency and/or severity of abdominal pain in IBS patients may not be as prevalent, ranging from 33.0% to 70.0%, resulting in a low prevalence of Rome IV IBS in these countries. 48 Therefore, the latest Asian consensus on IBS suggests that the pain component should be de-emphasized in Asia and that abdominal bloating should be added to the diagnostic criteria for IBS. 49 The same level of nociceptive intensity can manifest as pain in one individual but as mere discomfort in another. Furthermore, because the pathophysiology of IBS involves complex interplay between biological and psychosocial components, its expression may differ between cultural backgrounds. It is important to note that while the Asian continent currently has the highest number of LMICs, further research is needed to explore the clinical characteristics of IBS symptom perception at the regional level in order to develop local guidelines.

A major challenge in diagnosing IBS is that it relies heavily on symptom criteria, leaving it at risk because of inherent ambiguities in how patients express and how clinicians interpret symptoms. 29 Due to language barriers and cultural variations, subjective reports of discomfort in patients with IBS may indicate an extensive spectrum of symptoms, including mild pain, bloating, distention, and fullness. Consequently, the Rome Foundation conducted a multinational survey of this issue in 2014. However, they discovered that none of these terms had a universally agreed-upon definition in either English- or non-English-speaking countries. 51 A recent study found that the majority of patients with IBS who met the Rome IV criteria also met the Rome III criteria. In fact, it revealed that they represent a subgroup of Rome III-positive patients with more severe symptoms. 52 The change in the threshold for abdominal pain frequency accounts for most of the differences between Rome III and IV. 53 In a study conducted in India and Bangla-

www.irjournal.org
desh, Rome IV criteria were less sensitive than Rome III criteria. The application of the Rome IV criteria led to a shift from IBS to other disorders of gut-brain interaction in patients who met the Rome III criteria. We believe that abdominal discomfort and pain are part of a continuum of nociceptive sensation severity. Assuming that a wide variety of patients are diagnosed and treated, an inclusive approach using less stringent diagnostic criteria, such as the Rome III criteria, may be effective. The Rome IV criteria continue to play a role in identifying individuals with IBS who experience more severe symptoms and may require a more intensive treatment approach.

DETERMINATION OF RELEVANT DIAGNOSTIC TESTING

Colonoscopy is commonly regarded as a reliable method for ruling out organic diseases in patients with suspected IBS. However, several international guidelines recommend a cautious approach in selecting IBS patients for colonoscopy in accordance with a positive diagnostic strategy endorsement. The concept of red flag or alarm symptoms/signs enhances the accuracy of distinguishing between patients with a high likelihood of having structural disease and those with a low likelihood of having such disease among those who meet symptom-based criteria. These symptoms include rectal bleeding, positive fecal occult blood test (FOBT) results, anemia, fever, nocturnal symptoms, unintended weight loss within the past 3 months, onset age > 50 years, and family history of CRC, inflammatory bowel disease, or celiac disease. The presence of such features in patients with suspected IBS indicates the necessity for further investigation, particularly colonoscopy, according to several guidelines. The diagnostic accuracy of IBS based solely on symptom-based criteria is moderate in patients with a low likelihood of organic disease, that is without alarming symptoms. The Manning, Rome I, and Rome II criteria have been reported to have specificities of 0.69, 0.70, and 0.66, respectively, in patients with IBS with no alarming symptoms. The Manning, Rome I, and Rome II criteria were found to have a sensitivity of 0.67, 0.72, and 0.69, respectively. However, a recent study reported that colonoscopy had no diagnostic yield in patients without red flag. This finding supports the preference for a positive diagnostic strategy over an exclusionary one when investigating IBS symptoms.

It has been reported that alarm symptoms and signs are highly prevalent among patients with IBS. A previous survey indicated that 70% of patients who fulfilled the Rome III criteria for IBS had at least one red flag. Furthermore, the performance of red flags in detecting organic gastrointestinal diseases in formally diagnosed patients with IBS only yields a positive predictive value ranging from 7% to 9%. Given this evidence, the incorporation of red flags into the Rome criteria may not improve sensitivity and may result in a substantial number of IBS cases being overlooked. Thus, a substantial proportion of patients presenting with alarm symptoms may not require colonoscopy for diagnostic purposes. A recent study involving patients with IBS defined according to the Rome IV criteria reported a similar incidence of alarming symptoms (75.3%). Interestingly, they discovered that anemia, fecal occult blood, and unintended weight loss have high predictive values for organic diseases. The positive predictive value of the combination of these 3 red flags was comparable to that of all alarm symptoms (92.2% vs. 91.7%, respectively). However, the combination of these 3 red flags led to a substantially lower rate of missed IBS diagnoses (34.1% vs. 74.8%). These results imply that these red flags may be useful in identifying patients requiring colonoscopy, but are not recommended as criteria for the exclusion of IBS. In LMICs, where endoscopy systems are limited, there is a need to refine referral prioritization for colonoscopies in IBS patients showing alarm symptoms. Based on the evidence suggesting that anemia and fecal occult blood are among the top 3 indicators for detecting organic disease, we propose that the complete blood count (CBC) and FOBT are the most valuable diagnostic tests for identifying IBS patients who would benefit from a colonoscopy. Additionally, we prefer fecal immunochemical tests over traditional guaiac FOBTs for FOBT testing due to their higher sensitivity and cost-effectiveness.

Parasitic infections may result in chronic symptoms such as bloating, diarrhea, and abdominal pain, resembling those of IBS, in contrast to the acute nature of bacterial and viral gastroenteritis. However, a study conducted in the United States reported that the prevalence of parasitic infections among patients with suspected IBS is very low (2%). Consequently, the ACG does not recommend routine stool testing for enteric pathogens in all patients with IBS. In LMICs, the environment is often characterized as nonsterile, exposing a significant portion of the population to both acute and chronic gastrointestinal infections. A population-based study in Nicaragua revealed that stool examinations of 16.6% of IBS patients were positive for parasites, with the most prevalent species being Entamoeba spp., followed by Giardia lamblia, Ascaris lumbricoides and Trichuris trichiura. A separate study conducted...
in Iran found that those who met the symptom criteria for IBS had a higher rate of parasitic infections, specifically *Blastocystis hominis* and *G. lamblia*, compared to the healthy individuals. Therefore, it is crucial to test for parasitic infections in IBS, as it aids in identifying the underlying cause of the symptoms and facilitates the implementation of more efficient treatment strategies. These findings support the inclusion of a complete stool test as a standard diagnostic procedure for patients with suspected IBS in LMICs. Microscopic analysis of stool tests, specifically the presence of parasites and egg worms, will be the key indicator in excluding parasitic infection and helminthisis.

Clinicians should also consider the IBS subtypes when deciding whether additional diagnostic tests should be performed. In a study of 352 patients with IBS, the subtype IBS-D had the highest prevalence of organic disease (17%), followed by IBS-M (9%) and IBS-C (6%). Microscopic colitis, and not inflammatory bowel disease or CRC, explains the higher incidence of organic diseases detected by colonoscopy in diarrheal IBS than in constipation IBS. Microscopic colitis is a chronic inflammatory bowel disease that primarily affects older individuals, particularly women aged 60 years or older; therefore, a colonoscopy may be justified to exclude microscopic colitis in elderly women with suspected IBS-D. Furthermore, some patients with IBS symptoms require special consideration during CRC screening. However, colonoscopy screening age criteria vary across guidelines. A study in Thailand, an LMIC, demonstrated that colonoscopy screening for CRC starting at 50 years of age is cost-effective and can prevent the development of both the early and late stages of the disease.

Given the existing evidence in LMICs, we maintain the view that when a patient aged 50 years or older is suspected of having IBS but has never had a colonoscopy for CRC screening, the decision to perform one should be based exclusively on the patient’s age, irrespective of their symptoms. It is crucial to acknowledge that the implementation of screening program must consider and adapt to variations in the healthcare systems, economy, and infrastructure. Further investigation is re-

---

**Fig. 1.** Proposed diagnostic algorithm for irritable bowel syndrome (IBS) in low- and middle-income countries. CRC, colorectal cancer; CBC, complete blood count; FOBT, fecal occult blood test; GI, gastrointestinal.
required at the regional level to precisely determine the specific age thresholds. In addition, it is generally accepted that patients with a family history of CRC who are suspected of having IBS should undergo a screening colonoscopy based on their average risk. It is important to highlight that if symptoms persist despite receiving the standard treatment for IBS, it may be justifiable to consider performing a colonoscopy to clarify the ambiguity. Fig. 1 summarizes our proposed diagnostic algorithm for IBS in LMICs.

FUTURE DIRECTIONS

Guidelines for IBS have been developed by experts with the potential for a translational gap in daily practice. Approximately one-third of general practitioners routinely use the Rome criteria to diagnose IBS, whereas gastroenterologists use them infrequently. In Mexico, the Rome criteria are widely accepted and regarded as the reference standard for defining IBS. However, clinicians lack familiarity with the different versions of it. In a survey, 64.6%, 11%, 0.8%, and 23.6% of the providers were found to employ the Rome III criteria, Rome II criteria, Rome I criteria, and their experience in practice, respectively; none reported using the Manning criteria. Nevertheless, those who met the Rome III criteria were more likely to establish an accurate diagnosis than were those who did not (72.0% vs. 33.3%, P < 0.05). The diagnosis and subtype classification of IBS relies heavily on the patient’s description of symptoms to the clinician. To accurately diagnose IBS, it is essential to have an in-depth understanding of patients’ perceptions and interpretations of their symptoms. Cultural factors significantly shape the expression of symptoms among individuals from diverse ethnic backgrounds. The development of the Rome III/IV diagnostic questionnaire for IBS can provide clinicians with a standardized tool for assessing patient symptoms, aiding in the diagnosis of IBS and the classification of its subtypes. Therefore, it is imperative to conduct studies on the translation and validation of diagnostic questionnaires into the languages used in each country.

Laboratory tests such as CBC, FOBT, and complete stool test are typically accessible in primary, secondary, and tertiary healthcare settings. On the other hand, colonoscopy is a costly procedure that is typically available only in specialized tertiary healthcare facilities. A survey of 15 LMICs revealed the significant burden of access to endoscopy services. Malawi and Rwanda, as extreme examples, had only one medically trained gastroenterologist and fewer than 11 endoscopy centers. Despite having a greater number of endoscopic services, other LMICs reported more centers in the private sector than in the public sector, with the majority located in urban areas. Moreover, the majority of LMICs do not have a single universal national health insurance scheme. A low level of public funding and a high burden of out-of-pocket expenses characterize the healthcare landscape, which is marked by regional variations in access, insurance coverage, and health outcome. The commitment of each nation’s stakeholders is crucial in resolving this issue. The diagnostic algorithm proposed in this study provides insights into the optimal utilization of resources based on existing evidence.

CONCLUSIONS

IBS is a prevalent gastrointestinal disorder that causes significant impairment and imposes an enormous burden on the global healthcare system. Research on IBS is primarily conducted in HICs, making it challenging to implement diagnostic strategies in LMICs due to differences in disease characteristics, healthcare resources, and socioeconomic factors. A positive diagnostic strategy that relies on symptom-based criteria and minimal routine tests is safer and more cost-effective than an exclusionary approach. Rome III may be more suitable for populations with LMICs than Rome IV is because of its higher sensitivity and inclusion of milder symptoms, such as bloating, in addition to pain. In addition to careful history-taking, CBC, FOBT, and complete stool test are sufficient to identify suspected IBS patients with a higher likelihood of having organic diseases to justify colonoscopy. The diagnostic algorithm we propose was developed with a limited setting perspective while considering the evidence currently available. Well-designed and adequately funded research on, which includes a diverse population in developing countries, is crucial for developing effective diagnostic strategies for LMICs.

ADDITIONAL INFORMATION

Funding Source
This study was supported in part by Airlangga Research Fund 2023, Universitas Airlangga.

Conflict of Interest
No potential conflict of interest relevant to this article was reported.
Data Availability Statement
Not applicable.

Author Contributions

ORCID
Hidayat AA https://orcid.org/0000-0002-9384-2172
Waskito LA https://orcid.org/0000-0002-9400-1973
Sugihartono T https://orcid.org/0000-0003-4923-9832
Aftab H https://orcid.org/0009-0007-6027-829X
Rezkitha YAA https://orcid.org/0000-0001-7600-9114
Vilaichone RK https://orcid.org/0000-0003-4298-9331
Miftahussurur M https://orcid.org/0000-0003-1415-6033

REFERENCES


52. Aziz I, Törnblom H, Palsson OS, Simrén M. How the change in IBS criteria from Rome III to Rome IV impacts on clinical characteristics and key pathophysiological factors. Am J Gastroenterol 2018;113;1017-1025.


