

Introduction and epidemiology of irritable bowel syndrome

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Abstract

Irritable bowel syndrome (IBS) is a chronic disease and one of the main disorders of the brain-gut axis, previously considered functional disorders. Recent studies show that its pathophysiology is multifactorial, involving genetic, inflammatory, gut microbiota, hypersensitivity, and psychosocial factors. It affects quality of life and work capacity. According to the Rome IV criteria (2016), IBS is characterized by recurrent abdominal pain at least 1 day a week, associated with changes in bowel movements. There are three subtypes: with constipation (IBS-C), with diarrhea (IBS-D), and mixed (IBS-M). Historically, attempts to classify IBS have been made since the 19th century. Important advances include the Manning criteria (1978) and the evolution of the Rome Criteria (I to IV). In 2026, the new Rome V consensus is expected. Regarding its epidemiology, worldwide using the Rome IV criteria, the prevalence of IBS is 4.1% (higher in women and young adults). There are significant variations between countries. In México, depending on the criteria used, the prevalence ranges from 4% to 20%. The most common subtypes are IBS-C and IBS-M. To make the diagnosis, we can use the Rome criteria, as long as there are no alarming signs. These criteria are based on the following symptoms: recurrent abdominal pain (≥ 1 time/week) related to defecation, changes in stool frequency and consistency, in the absence of alarm signs, and is subclassified according to the Bristol Stool Form Scale. Risk factors have been described, such as diet, GI infections, dysbiosis, genetics, stress, anxiety, adverse childhood experiences, and socioeconomic factors. Anxiety and depression are common, so it's important to screen for them, as they impair quality of life and impact treatment response. IBS generates high direct and indirect health costs, work absenteeism, and decreased productivity (presenteeism). It severely impacts quality of life, especially the IBS-D, causing social, occupational, and personal limitations.

Keywords: Brain-gut axis disorder. Chronic. Functional. Intestinal.

Introducción y epidemiología del síndrome de intestino irritable

Resumen

El síndrome de intestino irritable (SII) es una enfermedad crónica y uno de los principales trastornos del eje cerebro-intestino, antes considerados trastornos funcionales. Los estudios recientes muestran que su fisiopatología es multifactorial, involucrando factores genéticos, inflamatorios, microbiota intestinal, hipersensibilidad y aspectos psicosociales. Afecta la calidad de vida y la capacidad laboral. Según los criterios de Roma IV (2016), el SII se caracteriza por dolor abdominal recurrente al menos 1 día a la semana, asociado a cambios en las evacuaciones. Hay subtipos: con estreñimiento (SII-E), con diarrea (SII-D) y mixto (SII-M). Históricamente, desde el siglo XIX se intentó clasificarlo. Los criterios de Manning (1978) y la evolución de los criterios de Roma (I a IV) han sido avances importantes, y para 2026 se espera el nuevo consenso de Roma V. En cuanto a su epidemiología, en todo el mundo, utilizando los criterios de Roma IV, la prevalencia de SII es del 4.1% (mayor en mujeres).

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y en adultos jóvenes). Hay variaciones importantes entre países. En México, dependiendo de los criterios utilizados, la prevalencia oscila entre el 4% y el 20%. Los subtipos más frecuentes son el SII-E y el SII-M. Para realizar el diagnóstico se pueden utilizar los criterios de Roma, siempre y cuando no existan datos de alarma, los cuales están basados en los siguientes síntomas: dolor abdominal recurrente (≥ 1 vez por semana), relacionado con la defecación, cambios en la frecuencia y la consistencia de las heces, en ausencia de signos de alarma; se subclasifica de acuerdo con la escala de heces de Bristol. Hay factores de riesgo descritos, como la dieta, las infecciones gastrointestinales, la disbiosis, la genética, el estrés, la ansiedad, las experiencias adversas en la infancia y los aspectos socioeconómicos. La presencia de ansiedad y depresión es frecuente, por lo que es importante buscarlas, ya que deterioran la calidad de vida e impactan en la respuesta al tratamiento. El SII genera altos costos directos e indirectos en salud, ausentismo laboral y disminución de la productividad (presentismo). Además, afecta gravemente la calidad de vida, sobre todo el SII-D, causando limitaciones sociales, laborales y personales.

Palabras clave: Trastorno del eje-cerebro-intestino. Crónico. Funcionales. Intestinales.

Introduction

Within the Rome IV classification of disorders of gut-brain interaction (DGBIs) are the intestinal disorders, among which the most relevant and most extensively studied is irritable bowel syndrome (IBS).

Previously, these conditions were referred to as “functional disorders,” as organic causes explaining the symptoms were excluded. However, with the advent of the Rome classification, which categorized and classified them, further studies demonstrated the complex pathophysiology of these multifactorial diseases, with contributing factors such as genetics, microinflammation, dysbiosis, hypersensitivity, and psychosocial disturbances, among many others.¹

IBS is a chronic disease, and in addition to alterations in bowel function, the presence of abdominal pain affects patients' quality of life and work capacity.

Definition and historical progression

According to the Rome IV consensus (2016), IBS is characterized by recurrent abdominal pain, present at least 1 day per week, associated with changes in bowel habits. Subtypes are determined by stool characteristics according to the Bristol classification: IBS with constipation (IBS-C), with diarrhea (IBS-D), and mixed type (IBS-M).

It is common for IBS to overlap with other DGBIs, such as functional dyspepsia or functional heartburn, as well as with extraintestinal symptoms that occur in a context of hypersensitivity, such as fibromyalgia.²

Diagnosis can be established based on the Rome IV criteria in the absence of alarm features, such as unintentional weight loss, GI bleeding, anemia, signs of malabsorption, or symptom onset after age 40. In Mexico, systematic studies are recommended, including complete blood count, serum chemistry, stool

culture, and stool parasitology, due to the high prevalence of parasitic diseases. It is also important to consider organic conditions that may present similarly, such as celiac disease and lactose intolerance.

The first reports of IBS date back to the 19th century, when it was considered a poorly understood health problem, and early attempts at classification were made. In 1962, Chaudhary and Truelove published a study in Oxford, England—the first formal attempt—describing symptoms that remain relevant to this day.³ In 1978, the Manning criteria were developed in Bristol after evaluating 109 patients and investigating 15 symptoms. These findings clarified that IBS should be considered a diagnosis of exclusion, characterized by bloating, pain relief with defecation, and changes in stool frequency and form associated with pain.⁴ In 1989, Thompson et al⁴ established the first consensus-based diagnostic criteria for IBS, referring to this publication as The Delphi Oracle and the Roman Consensuses.⁵ The following year, they published a classification system for functional disorders. From 1991 onward, working groups were formed, dividing disorders by organ system and publishing symptom-based clinical criteria. In 1993, a questionnaire with diagnostic criteria was developed, and a national survey was conducted in the United States,⁶ creating the first epidemiological database on the prevalence and demographics of functional disorders—an extraordinary vision by these investigators to gather greater insight. Since then, these criteria have evolved constantly: Rome I in 1989, specific Rome I criteria for IBS in 1992, Rome II in 1999, Rome III in 2006, and 10 years later Rome IV, including epidemiology, pathophysiology, clinical features, psychosocial aspects, diagnostic evaluation, and treatment of 33 disorders in adults and 17 in children. These conditions, previously labeled “functional,” are now recognized as disorders of gut-brain interaction. It is important to note that the Rome

Foundation is an international effort aimed at generating scientific evidence to improve diagnosis and treatment of these conditions.

Nonetheless, changes are not always well received. In 2016, the new Rome IV criteria for IBS became more stringent: abdominal pain frequency changed from ≥ 3 days per month to ≥ 1 day per week, significantly altering epidemiological reports. Because of this stricter definition, a subgroup of patients with milder symptoms may be excluded. Rome V will soon be released, and updated criteria are anticipated.

Global and Mexican epidemiology

Recently, the Rome Foundation conducted a global survey on the prevalence of disorders of gut-brain interaction (DGBIs) across 33 countries and 6 continents, using both online and face-to-face questionnaires.⁷ A total of 73,076 individuals were evaluated, of whom 49.5% were women. At least 1 gut-brain disorder was identified in 40% of respondents, with higher prevalence among women, along with poorer quality of life and increased health care utilization vs asymptomatic subjects.

The prevalence of IBS according to Rome IV was 4.1% (5.2% in women and 2.9% in men). The age group with the highest prevalence was 18-39 years (5.3%), followed by 40-64 years (3.7%), and ≥ 65 years (1.7%). Prevalence varied by population, ranging from as low as 1.3% (0.8-1.8%) in Singapore to as high as 7.6% (6.4-8.7%) in Egypt. In most countries, prevalence ranged between 3% and 5%. However, when Rome III criteria were applied, prevalence was higher, reaching 10.1% (9.8-10.5%).

By subtype, the most prevalent was IBS-C at 1.3% (1.8% in women and 0.8% in men), followed by IBS-M at 1.3% (1.8% in women and 0.9% in men), IBS-D at 1.2% (1.3% in women and 1% in men), and unclassified IBS (IBS-U) at 0.3%.

A 2020 systematic review and meta-analysis evaluated 57 studies, representing 92 adult populations across 24 countries, with a total of 423,362 patients found an IBS prevalence of 9.2% (95% CI, 7.6-10.8) using Rome III criteria and 3.8% (95% CI, 3.1-4.5) using Rome IV.⁸ IBS-M was the most common subtype under Rome III (33.8%), whereas IBS-D was most frequent under Rome IV (31.5%). Prevalence was higher among women (OR, 1.46; 95% CI, 1.33-1.59) and varied widely across countries, from as low as 0.5% in India to as high as 29% in Croatia. These findings again suggest that Rome IV criteria are more restrictive and thus lower

prevalence estimates. It should also be noted that symptoms may fluctuate over time and resemble those of other conditions.

In Mexico, several studies have been conducted. In 2001, Huerta et al⁹ conducted a systematic review of 18 studies published since 1996 and found a prevalence of 17%-20% using Manning and Rome criteria. In 2006, Schmulson et al¹⁰ reported a frequency of functional bowel disorders of 35% in healthy university volunteers in Mexico City, more common in women, with a mean age of 30.8 years, and IBS-C as the most frequent subtype. In 2010, Valerio-Ureña et al¹¹ evaluated an open population in Veracruz ($n = 459$) and found a prevalence of 16.9%, again more frequent in women, with a mean age of 31.2 years and IBS-C as the predominant subtype. Also in 2010, the Mexican IBS Study Group¹² reported the first nationwide prevalence using Rome III criteria, across 22 states ($n = 1667$). The mean age was 36.9 years, with higher prevalence among women (76%)—a female-to-male ratio of 3.3:1. Subtype distribution was IBS-M in 48.4%, IBS-C in 43%, IBS-D in 5.6%, and IBS-U in 2.8%.

In 2012, Schmulson et al¹² reported the epidemiology of functional disorders in Tlaxcala ($n = 500$) using Rome II criteria, with an IBS prevalence of 16%.

In 2014, Amieva-Balmmori et al¹³ conducted a nationwide survey using Rome III criteria, including 3925 subjects (56.7% women; mean age, 39.8 ± 13 years). IBS prevalence was 7.6% (95% CI, 6.8-8.5), more common among housewives and professionals, as well as in those with higher education levels. The most common subtype was IBS-C (47%), followed by IBS-M (43%). Overlap was documented with functional heartburn in 22% and functional dyspepsia in 17%.

Regarding IBS prevalence by Rome IV in Mexico,¹⁴ the Global Survey evaluated 2001 individuals and reported at least one DGBI in 40% of the population, with IBS prevalence of 4% by Rome IV and 12.6% by Rome III.

Current diagnostic criteria

The Rome criteria emerged out of necessity in IBS because of the lack of a reference study or biomarker for diagnosis, aiming to facilitate a standardized diagnosis and ensure a common language worldwide, while also avoiding unnecessary tests. Thus, this expert consensus was developed to provide a symptom-based diagnosis, obviously after excluding alarm features. These criteria have a sensitivity of 62.7% and a specificity of 97.1% for the diagnosis of IBS.

Table 1. Epidemiologic evolution of IBS in Mexico

Authors	Year	Rome criteria	Population	Reported prevalence
Huerta et al. ⁹	2001	Manning/Rome I	Systematic review	17-20%
Schmulson et al. ¹⁰	2006	Rome II	Healthy volunteers (n = 324), Mexico City	35%
Valerio-Ureña et al. ¹¹	2010	Rome II	General population (n = 459), Veracruz	16.9%
Schmulson et al. ¹²	2010	Rome III	Patients (n = 1667)	IBS-M 48.4%, IBS-C 43%, IBS-D 5.6%, IBS-U 2.8%
López-Colombo et al. ¹²	2012	Rome II	General population (n = 500), Tlaxcala	16%
Amieva-Balmori et al. ¹³	2014	Rome III	National general population (n = 3925)	7.6%
Sperber et al. ⁷	2021	Rome III	General population (n = 2001)	12%
Sperber et al. ⁷	2021	Rome IV	General population (n = 2001)	4%

IBS-D, irritable bowel syndrome with diarrhea; IBS-C, irritable bowel syndrome with constipation; IBS-M, mixed irritable bowel syndrome; IBS-U, unclassified irritable bowel syndrome.

According to the Rome IV consensus (2016), IBS is characterized by recurrent abdominal pain, which must be present at least 1 day per week, associated with altered bowel habits—either constipation, diarrhea, or mixed. In addition, patients must have 2 or more of the following: 1) pain related to defecation; 2) pain associated with a change in stool frequency; or 3) pain associated with a change in stool form. These symptoms must be present during the past 3 months, with onset at least 6 months before diagnosis (Table 1).¹⁵

IBS is categorized into subtypes according to stool characteristics, classified using the Bristol Stool Form Scale:

- IBS-C is characterized by > 25% hard stools (Bristol 1-2) and < 25% loose stools (Bristol 6-7), without laxative use.
- IBS-D is characterized by > 25% loose stools (Bristol 6-7) and < 25% hard stools (Bristol 1-2).
- IBS-M is characterized by > 25% loose stools (Bristol 6-7) and > 25% hard stools (Bristol 1-2).
- IBS-U is considered when patients meet diagnostic criteria but their bowel pattern does not fit any of the above.

Risk factors and patient profile

The pathophysiology is complex, and risk factors are still being identified. Proposed factors include genetics, diet, alterations in the gut microbiota, dysbiosis, GI infections, psychological aspects (particularly anxiety, depression, and stress), environmental and socioeconomic factors, and adverse childhood experiences.¹⁶ In the biopsychosocial model proposed by Rome, all of these factors may influence bidirectional communication

of the gut-brain axis. However, postinfectious IBS is the only clearly established causal factor.

Both external and intrinsic risk factors have been described.¹⁷ Among external factors, diet plays a key role: consumption of ultra-processed foods, alcohol, fats, spicy foods, and allergens may trigger symptoms. Environmental exposures such as air pollution, contact with animals, short breastfeeding periods, tobacco use, cohabitation, and poor hygiene have also been implicated. Socioeconomic aspects—such as adverse childhood experiences, being a medical or postgraduate student, poor sleep quality, excessive work, shift work, low income, or being the child of a young mother—have also been linked.

Intrinsic factors include:

- Psychological: anxiety, depression, somatization, stress, eating disorders, post-traumatic stress disorder, history of trauma or abuse.
- Genetic: female sex, family history of IBS, genetic polymorphisms, low birth weight, and increased intestinal permeability.
- Pathological: migraine, vitamin D deficiency, temporomandibular dysfunction, fibromyalgia, visceral hypersensitivity, food hypersensitivity, and sleep disorders.
- Microbiota-related: *Clostridium* difficile infection, antibiotic exposure, dysbiosis, and gastroenteritis.

Epidemiological studies show that IBS is more common in women, particularly in the 3rd and 4th decades of life. In the SIGAME study in Mexico, IBS prevalence was higher among housewives and professionals, and risk increased with higher educational level. Anxiety and depression were present in more than 30% of IBS patients.¹³

Socioeconomic impact and quality of life

IBS not only affects patients but also their families and society, as these patients use more health resources, including laboratory tests, imaging, and endoscopy. In Mexico, this is also reflected in the private sector.¹⁸

Although limited data are available in Mexico, estimates from other countries show the burden: in the UK, IBS costs £200 million annually, in Germany €4 billion, and in the United States an estimated \$1560-\$7540 per patient annually, with the highest costs related to emergency visits and hospitalizations.¹⁹

At the personal level, many IBS patients have difficulty working due to symptoms, leading to absenteeism (taking days off) or presenteeism (working but with reduced productivity). In Europe, IBS patients take nearly twice as many sick days as non-IBS subjects.²⁰ Indirect costs are substantial and comparable to those of other chronic diseases such as asthma and migraine. In the United States, absenteeism costs were estimated at \$901 annually in IBS patients vs \$528 in non-IBS subjects.

From the outset, IBS has been recognized as detrimental to quality of life, particularly when overlapping with other DGBIs or accompanied by psychological factors such as anxiety and depression.

Among subtypes, IBS-D has the greatest impact due to fear of incontinence, leading patients to avoid going out or traveling. IBS-C patients report avoidance of sexual activity, embarrassment, and concentration difficulties. Work-related consequences include absenteeism, income loss, and difficulty socializing or traveling.²¹

In general, patients report feelings of lack of freedom and spontaneity, as well as stigma from family, friends, and health professionals, who often show little understanding or empathy for their condition.

The impact on family members of IBS patients is less well known. One study assessed partners of 152 IBS patients and found significantly greater perceived stress vs partners of healthy controls ($p = 0.0002$), with the effect correlating with IBS severity.²²

Some studies suggest that quality of life in IBS patients is worse than in those with organic diseases, such as inflammatory bowel disease, underscoring the need for empathy from health professionals.²³

Unfortunately, in some cases, consultation with an expert leads only to modest improvement, which often does not persist over time.²⁴ This highlights the need

for a comprehensive, multidisciplinary approach that evaluates not only GI symptoms but also physical, emotional, and social factors that may worsen symptoms and further impair quality of life.

IBS as a public health problem

IBS represents a public health issue due to direct health care costs and indirect costs from work absenteeism and presenteeism. Even if prevalence rates remain stable, projected population growth in Mexico and globally means that more people will be affected. A 2018 report found that IBS patients wait an average of 4 years before diagnosis, requiring multiple medical visits and tests.²⁵ Evidence-based management to minimize unnecessary testing and optimize treatment can help reduce costs. A Dutch study²⁶ showed that most costs are due to lost productivity, whereas direct medical costs were related to comorbidities. Patient characteristics associated with higher costs included age, sex, employment status, IBS subtype, quality of life, and depression severity.

Better training for primary care physicians to ensure early diagnosis, timely treatment, referral to gastroenterologists for refractory cases, and maintaining a good physician-patient relationship can all improve patient quality of life.

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Conflicts of interest

The authors declared no conflicts of interest whatsoever.

Ethical considerations

Human and animal protection. The authors declare that no experiments on humans or animals were performed for this research.

Confidentiality, informed consent, and ethics approval. This study does not involve patient personal data and does not require ethics approval. SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in writing this manuscript.

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