



An Asian perspective on irritable bowel syndrome

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Irritable bowel syndrome (IBS) is a prevalent chronic disorder, and its epidemiology depends on the diagnostic criteria used. Recently, the Rome IV criteria for IBS were published by changing the frequency of abdominal pain and excluding abdominal discomfort from the previously used Rome III criteria. However, the recent Asian consensus on IBS recommends the inclusion of abdominal discomfort and abdominal pain as diagnostic criteria. The low fermentable oligo-, di-, mono-saccharides, and polyols (FODMAP) diet has been proven to be effective in Western patients. Moreover, recent well-designed studies reported its effectiveness and the microbial changes after implementing it in Asian patients with IBS. However, traditional Korean foods including kimchi, one of representative FODMAP-rich food, exhibited a poor correlation with the food-related symptoms of IBS. Therefore, the low FODMAP diet protocol should be cautiously applied to IBS patients, especially to Korean patients with IBS. In Asian countries, there are lots of traditional herbal medicines and treatments for IBS; however, these studies have limitations including the heterogeneity of herbal mixtures and relatively small sample size. Therefore, well-designed studies based on large samples are required to validate complementary and alternative medicine in the treatment of Asian patients with IBS. (Intest Res 2023;21:189-195)

Key Words: Irritable bowel syndrome; Diagnosis; Therapy

INTRODUCTION

Irritable bowel syndrome (IBS) is a prevalent chronic disorder characterized by abdominal pain associated with altered bowel habits with changes in stool frequency and/or form. IBS is common in worldwide population-based study.^{1,2} However, a recent study has reported the difference in the prevalence determined using the Rome III and IV criteria.¹ The complex pathogenesis of IBS includes visceral hypersensitivity, disordered gut-brain interaction, cytokine-mediated inflammation, dysmotility in gastrointestinal tract, and mucosal immune dysfunction.³⁻⁶ Thus, IBS is caused by a combination of factors, including different pathophysiologic mechanisms.⁴ During the

evolution of studies regarding pathogenetic mechanism of IBS, the role of diet has been emphasized, and the concept of low fermentable oligo-, di-, mono-saccharides, and polyols (FODMAP) diet has been developed by Western countries.^{7,8} However, the dietary habits in Western and Asian countries are quite different.⁹ Moreover, Asian countries have a long history of using their own herbal medicines for the treatment of functional gastrointestinal disorders including IBS.¹⁰ However, the efficacy of most of these medicines has not been validated. In this review, we aimed to investigate the current issues of IBS in Asian patients of IBS compared with Western point of view.

DIFFERENCE IN EPIDEMIOLOGY AND DIAGNOSIS OF IBS BETWEEN THE EASTERN AND THE WESTERN COUNTRIES

The prevalence of IBS varies by geographic regions and populations.^{1,2,10} Moreover, the prevalence has changed due to the use of different diagnostic criteria, starting from Manning cri-

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teria to recently published Rome IV criteria.¹⁰ A population-based survey in Korea reported a prevalence of 7.1% in men and 6.0% in women using the Rome II criteria.¹¹ However, another population-based survey in Korea revealed a prevalence of 7.0% in males and 11.0% in females using the Rome III criteria.¹² Finally, an internet survey in Korea reported a prevalence of 4.7% (3.8%–5.6%) using the Rome IV criteria.¹ Recently, a global epidemiologic study compared the prevalence of IBS determined using the Rome III and IV criteria.¹ The study found that the pooled prevalence rate of IBS determined using the Rome III was higher than that determined using the Rome IV criteria, regardless of sex.¹³ The reason for this difference is the fact that the currently using Rome IV criteria is more stringent than the previously used Rome III criteria.¹⁴ A major difference between the Rome III and IV criteria is the exclusion of abdominal discomfort from the Rome III criteria and the retention of only abdominal pain in the Rome IV criteria.¹⁴ The reason is that some cultural backgrounds and languages do not have appropriate terminology for discomfort.^{13,15} Moreover, the term “improvement with defecation” in the Rome III criteria was changed to “related” to defecation in the Rome IV criteria. Finally, the frequency of symptoms was changed from “at least 3 days per month” in the Rome III criteria to “at least 1 day per week” in the Rome IV criteria.¹⁴ However, the recent Asian consensus on IBS accepted the terminology of recurrent abdominal discomfort as well as abdominal pain despite the low evidence.¹⁶ The consensus group reported that pain is not a universal symptom in patients with IBS.¹⁶ Moreover, consensus group described that the Asian patients with IBS might have only mild symptoms including abdominal discomfort or bloating.¹⁶ A study from Singapore showed that 62% of patients with IBS complained of abdominal bloating rather than abdominal pain.¹⁷ Another study from Hong Kong reported that 68% of patients with IBS complained of abdominal bloating.¹⁸ However, only 32% of Hong Kong patients with IBS complained of abdominal pain.¹⁸ On the other hand, a study from the United States reported that 100% of patients with IBS complained of abdominal pain.¹⁹ However, 83% of patients with IBS complained of abdominal bloating.¹⁹ Additionally, the frequency of IBS symptoms varies across countries.^{15,20} The reported rates of abdominal pain were the highest in Italy and the lowest in Calcutta, India.^{10,20,21} Cultural backgrounds and dietary pattern including vegetarian dietary pattern may contribute to these differences.^{10,21} Therefore, the diagnostic cutoff for symptom frequency and duration still needs to be validated in Asian patients with IBS.¹⁶

ROLE OF DIET IN THE PATHOGENESIS OF IBS IN ASIAN PATIENTS

Diet is known to be an important factor in the pathogenesis of IBS.^{4,6-8,22} However, the dietary habits in Western and Asian countries are quite different.⁹ For example, the traditional Asian diets are composed of a higher amount of fiber than most Western diet.¹⁵ Therefore, the approach for dietary habit adjustment and diet education in Asian patients with IBS could be different from that in Western patients.⁹ FODMAPs, which are naturally found in various kinds of foods, are a group of easily fermentable short-chain carbohydrates that are either indigestible or absorbed slowly in the small intestine; the role of FODMAPs has been emphasized in the pathogenesis of IBS.^{9,22,23} Moreover, they can easily undergo colonic fermentation.²³ Therefore, they may cause abdominal distension and release gases (hydrogen, carbon dioxide, and methane) due to intestinal bacterial fermentation.²³

1. Role of FODMAP in Asian Diet

Since the introduction of the concept of a low FODMAP diet for the treatment of IBS, studies in Western countries have shown that a low FODMAP diet is more effective compared with conventional Western diet including traditional Australian diet.²⁴ Moreover, few recent studies have shown that a low FODMAP diet is more effective in Asian patients with IBS compared with conventional Asian foods.²⁵⁻²⁷ Usually, traditional Korean food includes white rice and various side dishes containing seasonings and sauces.^{9,28} Rice has low fiber content, which is absorbed nearly completely in the small intestine. Rice is main source of carbohydrate in Asian people. On the other hand, kimchi is a traditional Korean side dish that contains FODMAP-rich ingredients, such as garlic, napa cabbage, and onion.²⁸ Moreover, kimchi is usually served as a side dish with nearly all Korean foods. Therefore, it is difficult to restrict kimchi consumption in Korean people. A recent questionnaires-based cross-sectional study from Korea investigated the difference between the IBS group (n = 186) and non-IBS group (n = 671).²⁹ The study found that the IBS group had significantly higher FODMAP intake than the non-IBS group (13.9 ± 9.9 g/day vs. 12.6 ± 9.7 g/day, $P = 0.030$).²⁹ Moreover, the IBS group consumed a significantly higher amount of fat than the non-IBS group (86.6 ± 55.1 g/day vs. 76.9 ± 47.9 g/day, $P = 0.014$).²⁹ Additionally, foods containing high amount of fat and gluten such as instant noodles (70.8%), Chinese noodles with vegetables and seafood (68.7%), pizza (67.2%), and black bean

sauce noodles (66.3%) were correlated with IBS symptoms.²⁹ Another Korean study based on self-reported questionnaire on food habits also suggested that fat-rich foods (25.0%), gluten-rich foods (23.8%), spicy foods (15.0%), and dairy products (15.0%) were associated with symptoms in patients with symptomatic IBS (n = 167) compared with that in asymptomatic controls (n = 125).³⁰ The most common Korean food causing IBS symptoms were shown to be whole milk (34.7%), instant ramen (28.7%), black bean sauce noodles (24.8%), and pizza/hamburger (23.8%).³⁰ Previous FODMAP diet trials reported a total FODMAP intake of approximately 17–30 g/day in Western countries.^{31–33} A comparison between studies regarding the amount of FODMAP consumed by IBS patients in Korea and Western countries revealed a relatively lower consumption of FODMAP in Korean patients with IBS than that in Western patients with IBS. Interestingly, the results of the abovementioned studies indicate that traditional Korean foods including kimchi, which is a FODMAP-rich food, have a poor correlation with the food-related symptoms of IBS.²⁹ Therefore, one must be careful while applying the low FODMAP diet protocol developed by studies conducted in Western countries to Asian patients with IBS, especially to Korean patients with IBS.²⁹ The recent Asian consensus on IBS also emphasized the need of further studies to validate the role of a low FODMAP diet for the management of IBS.¹⁶

2. Content of FODMAP in Asian Diets

Another issue is the lack of knowledge about the exact FODMAP content in Asian foods among Asian patients with IBS.²⁶ Unlike the exact FODMAP content in Western foods, the exact FODMAP content in Asian foods is difficult to measure.²⁶ Generally, complex recipes are used to prepare Asian foods, including bibimbap in Korea or pad thai in Thailand, using more than 5 ingredients and FODMAP-rich sauces.^{9,27} Traditional Korean foods are served with more than 5 side dishes. Therefore, a mixture of more than 25 ingredients is consumed per Korean meal, making the exact calculation of FODMAP content in Asian foods very difficult.^{27,29} It is possible to under- or overestimate the FODMAP content in Asian foods.²⁶

3. Effectiveness of a Low FODMAP Diet in Asian IBS

However, recently published well-designed controlled trials in Asian countries also showed the effectiveness of a low FODMAP diet in patients with IBS.^{25,26} A prospective randomized trial in India including patients with diarrhea-predominant IBS who were categorized into the low FODMAP diet (n = 52)

and traditional dietary advice (n = 49) groups reported symptomatic improvement in a significantly higher number of patients in the low FODMAP diet group than that in the traditional dietary advice group (32/51 [62.7%] vs. 20/49 [40.8%], *P* = 0.0448) 4 weeks after the implementation of the diets.²⁶ This effect of diet continued up to 16 weeks (52.9% in the low FODMAP group vs. 30.6% in the traditional dietary advice group, *P* = 0.0274).²⁶ Another randomized controlled study in China including patients with diarrhea-predominant IBS who were categorized into the low FODMAP (n = 54) and traditional dietary advice (n = 54) groups also showed similar results (30/54 in the low FODMAP group vs. 26/54 in the traditional dietary advice group).²⁵ However, the low FODMAP group showed improvement in stool frequency and excessive passing of wind earlier than the traditional dietary advice group.²⁵ Moreover, a recently published systematic review and network meta-analysis based on 13 randomized controlled trials (RCTs) (a total of 944 patients including 275 Asian patients from 3 studies in Asian countries) also showed that a low FODMAP diet was the most effective treatment for abdominal pain, bloating, and distension.³⁴

4. Celiac Disease and Gluten-Related Disorders in Asia

Recently published papers showed a relatively higher prevalence of celiac disease in some Asian countries, including India (1.23% in Northern India) and Iran.^{35,36} However, it is still a very rare disease in other Asian countries, including South Korea and Taiwan³⁶; on the other hand, the concept of non-celiac gluten hypersensitivity or wheat hypersensitivity has evolved, although the concept of non-celiac gluten hypersensitivity is still controversial.³⁷ Interestingly, a recent meta-analysis including 22 studies with 6,991 patients with IBS has shown that 3.3% (95% confidence interval [CI], 2.3%–4.5%) of them had celiac disease. In this study, they examined 10 Iranian (n = 3,123), 1 Chinese (n = 758), and 3 Indian (n = 795) studies.³⁸ Gluten and fructan in the FODMAP diet are thought to correlate with IBS-like symptoms in these patients³⁶; however, it still needs more evaluation and research to validate this relationship.

ROLE OF DIET IN THE MICROBIAL CHANGE IN ASIAN PATIENTS WITH IBS

Previous studies have shown that diet is one of the important factors that affect the microbial environment in humans.^{4,7,34} Previous studies in Western patients with IBS showed a reduction in the concentration and proportion of luminal *Bifidobac-*

terium species after implementing a low FODMAP diet.³¹ Bifidobacteria are important butyrate producers in the colon, and butyrate has an important role in colonic health.³⁹ Another study from Sweden showed that non-responders to a low FODMAP diet had a higher baseline dysbiosis index score compared with responders to a low FODMAP diet.⁴⁰ A recent study in patients with IBS described the long-term effectiveness of a low FODMAP diet as well as the microbial change after implementing a low FODMAP diet.⁴¹ The study found that two-thirds of enrolled patients showed symptomatic improvement after the implementation of a low FODMAP diet for 12 months, and there were no significant differences in baseline bifidobacteria count.⁴¹ However, the microbial change after implementing a low FODMAP diet in Asian patients with IBS has not been studied well until recently.

A recently published Chinese study in patients with diarrhea-predominant IBS reported similar findings regarding the microbial change after implementing a low FODMAP diet.²⁵ Patients consuming a low FODMAP diet showed a reduction in carbohydrate-fermenting bacteria including *Bifidobacterium* and *Bacteroides* species.²⁵ Moreover, they showed decreased saccharolytic fermentation.²⁵ High saccharolytic fermentation activity at baseline was related to a high symptom burden ($P=0.01$) and a favorable therapeutic response to the low FODMAP diet.²⁵ An Iranian study on 42 patients with IBS showed a significant increase in *Bacteroidetes* species after implementing a low FODMAP diet. Moreover, the ratio of *Firmicutes* to *Bacteroidetes* species decreased significantly ($P=0.001$).⁴² However, further studies are required to understand the role of a low FODMAP diet in the long-term change of microbial environment in Asian patients with IBS.

TREATMENT OF ASIAN PATIENTS WITH IBS

Based on the recently published Asian consensus of IBS, the conventional treatment recommendations in Asian and Western countries are not different.¹⁶ Complementary and alternative medicines (CAM) have been used in functional gastrointestinal disorders including IBS.⁴³ CAM therapies could be attractive to Asian patients who have failed to alleviate their symptoms by using conventional therapies for IBS.

In Asian countries, there are lots of traditional herbal medicines and treatments available for IBS.¹⁶ The recent Asian consensus guideline suggested that some CAM, such as peppermint oil and Kampo, could be effective treatments for IBS in Asian patients.¹⁶ The recently published American college of

gastroenterology guideline also recommended the use of peppermint to improve global IBS symptoms.⁴ Peppermint is an herbal medication for IBS. Its clinical benefits in patients with IBS have been shown to correlate with blockade of calcium channels by L-menthol and smooth muscle relaxation.⁴⁴ A recently published meta-analysis investigating the efficacy of peppermint for treating IBS identified 12 RCTs including 835 patients; among them, there were 101 Asian patients with IBS. An analysis based on 7 RCTs for the effect of peppermint oil ($n=253$) and placebo ($n=254$) on overall symptomatic improvement in patients with IBS revealed a relative risk of 2.39 (95% CI, 1.93–2.97; $P<0.00001$).⁴⁴ Peppermint oil has been tested at a treatment for IBS in many Southwest Asian countries, including Iran and Bangladesh, and its use is currently increasing in other Asian countries due to data from Western publications.^{45,46}

There is little evidence for the efficacy of the treatment using Kampo, a Japanese herbal medicine, in patients with IBS.⁴⁷ One of the Kampos, called Daikenchuto, is a traditional gastrointestinal prokinetic herbal medicine; it has been shown to reduce the symptoms of constipation in a limited number of studies.¹⁶ Shugan Jianpi Zhixie therapy has been used to treat diarrhea-predominant IBS.⁴⁸ In a recently published meta-analysis based on 7 RCTs including 954 patients, Shugan Jianpi Zhixie therapy was shown to significantly improve global IBS symptoms compared with placebo (relative risk, 1.61; 95% CI, 1.24–2.10; $P=0.0004$).⁴⁸ Tongxie Yaofang is another CAM that has been tested in patients with diarrhea-predominant IBS. A recently published, double-blind, placebo-controlled randomized trial involving 160 patients with diarrhea-predominant IBS reported a significant improvement of global symptoms (57.5% vs. 37.5%, $P=0.017$).⁴⁹ Thus, this treatment looks to be promising in the management of diarrhea-predominant IBS. Traditional Korean medicine is currently used under the national health insurance system for the management of IBS. However, there is an inadequacy of research findings to support this usage. Therefore, future research based on large number of cases is needed.

However, the designs of these studies have some limitations, including the heterogeneity of herbal mixtures and relatively small sample sizes, making it difficult to derive a strong conclusion based on them.¹⁰ Therefore, well-designed studies based on larger sample sizes are needed in the future to validate the use of CAM for the treatment of IBS in Asian patients.¹⁶

Acupuncture originated from traditional Chinese medicine.⁵⁰ The tips of needle are inserted into specific areas of the human

body, which is believed to improve functional gastrointestinal symptoms. However, acupuncture's effectiveness is still controversial.⁵⁰ A recently published meta-analysis paper showed that it did not show statistical differences based on 12 sham-controlled studies (relative risk, 1.11; 95% CI, 0.88–1.38).⁵⁰

CONCLUSIONS

The current status of IBS in Asian patients is different from that in Western patients. The direct application of a low FOD-MAP diet in Asian patients with IBS should be considered carefully. In the future, well-designed studies are required to validate the application of CAM including traditional Asian herbs for the treatment of IBS.

ADDITIONAL INFORMATION

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Conflict of Interest

Myung SJ is an editorial board member of the journal but was not involved in the peer reviewer selection, evaluation, or decision process of this article. No other potential conflicts of interest relevant to this article were reported.

Data Availability Statement

Not applicable.

Author Contribution

Conceptualization: Jung KW, Myung SJ. Funding acquisition: Myung SJ. Supervision; validation: Myung SJ. Writing - original draft: Jung KW, Myung SJ. Writing - review & editing: Jung KW. Approval of final manuscript: all authors.

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