

ORIGINAL ARTICLE

Early experience with a low FODMAP diet in Asian patients with irritable bowel syndrome

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Key words

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Introduction

Irritable bowel syndrome (IBS) is a functional bowel disorder in which chronic abdominal pain or discomfort is associated with irregularity in the stool form and passage in the absence of any organic cause to explain these symptoms.¹ The prevalence of IBS worldwide ranges between 10 and 20%.² In Malaysia, its prevalence has been reported to be between 10 and 15% based on both the Rome II and Rome III criteria.^{3–5} Although IBS does not result in mortality, it has a negative impact on quality of life due to physical suffering, psychological comorbidity, and social disability and results in economic nonproductivity and a significant health-care expenditure.^{6,7}

One of the main reasons for the negative impact of IBS is that treatment for this condition has remained unsatisfactory.

Abstract

Background: The efficacy and acceptance of a low fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAP) diet in Asian adults with irritable bowel syndrome (IBS) remain uncertain. We aimed to describe our early experience in a single center with a dedicated gastroenterology dietetic service.

Methods: Consecutive patients with IBS referred to our dedicated Dietetic Gastroenterology Clinic between February 2016 and May 2016 were screened. A low FODMAP diet was instituted as per standard protocol. Data on demographic and clinical variables were obtained from patients' records and prospective telephone interviews.

Results: A total of 16 patients, with a median age of 67 ± 13.57 years; female gender $n = 10$ (62.5%); ethnicity: Chinese $n = 8$ (50%), Indian $n = 5$ (31.25%), and Malay $n = 3$ (18.75%) with IBS, were included in the study. Compliance with the low FODMAP diet was complete in 8 of 16 (50%) patients, partial in 4 of 16 (25%), and 4 of 16 (25%) could not comply with the diet at all. Improvement in symptoms were reported in 11 of 16 (68.8%) patients. Among patients who complied (complete/partial) with the low FODMAP diet, predominant symptom improvement was reported as follows: abdominal pain 3 of 5 (60%), abdominal bloating/distension 7 of 10 (70%), and flatulence 7 of 8 (87.5%). Patients with the IBS-D subtype appeared to have the greatest improvement in stool consistency (87.5% IBS-D vs 12.5% non-IBS-D, $P = 0.009$).

Conclusion: Based on our pilot observational study of a relatively small sample of Asian IBS patients, compliance with a low FODMAP diet appears to be low. Further larger studies are required to verify our observation.

Commonly used pharmacological agents have not been effective in alleviating symptoms, which is the primary aim of IBS treatment. Therefore, there has been a focus on a nonpharmacological approach toward IBS management, of which dietary modification has shown the most promise.⁸ Among the various modifications that have been studied, diets low in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAPs) have demonstrated the best clinical evidence thus far.⁹

FODMAPs are a group of short-chained carbohydrate compounds that are highly fermentable but poorly absorbed in the small intestine. They constitute fructose and lactose, fructans, galacto-oligosaccharides, and polyols.¹⁰ FODMAPs have been recognized to contribute to symptoms in IBS patients by (i) increasing intestinal water volume due to the poorly absorbed,

osmotically active compounds in FODMAPs and (ii) excessive gas production and subsequent colonic distention due to their fermentation by colonic microbiota.^{10,11} Several observational studies and clinical trials using a low FODMAP diet, conducted primarily in Australian and European patients with IBS, have now demonstrated an approximate 70% overall symptom improvement.^{9,11} The improvement demonstrated in these dietary modification studies are far superior to most known pharmacological therapies in IBS.

To date, however, there has been a scarcity of reports regarding the efficacy of a low FODMAP diet in Asian patients with IBS. The Asian diet differs considerably from that of the West. The common food ingredients seen in the Asian diet include onion, garlic, shallots, legumes, and wheat-based products. Until recently, the FODMAP content of common Asian diets had not been formally documented until work by Iacovou M and colleagues from Monash, Australia, was published.¹² Malaysia is a melting pot of several major ethnic groups of the Asian continent—namely, Malays, Chinese, Indians, and several indigenous groups. The various cultural and dietary practices of these ethnic groups have made it fairly complex to identify and quantify the nature of specific food items that would contribute to symptoms of IBS in our community. Therefore, implementation of a low FODMAP diet is challenging. Nevertheless, our Gastroenterology Clinic initiated a dedicated dietetic service in 2016 with the primary aim of exploring the benefits of a low FODMAP diet in Asian patients, and we report our initial experience here.

Methods

This is a pilot study to explore the acceptability and response rate to a low FODMAP diet in Asian patients. This study was approved by this institution's ethics committee (MREC ID No: 20163–2320). A dedicated Gastroenterology Dietetic Clinic was commenced in 2016, on a weekly basis. The clinic consisted of two dietitians, trained in administering a low FODMAP diet based on food items analyzed by a laboratory at the Monash University.¹³

Patients were recruited consecutively to avoid selection bias. Informed consent was obtained from all patients. Clinical data and details of the dietary habits of all IBS patients referred to this clinic were prospectively collected. IBS patients were diagnosed based on the ROME III symptom criteria and the exclusion of common organic diseases (malignancy and inflammatory bowel disease) using laboratory and endoscopic tests. In accordance with standard administration of the low FODMAP diet, IBS patients were referred to the trained dietitians after clinical review. Detailed dietary assessments were conducted using the 24-h diet history to assess their habitual dietary intake. From here, the patients were informed about a low FODMAP diet from an Asian context and were provided with paper dietary and symptom records for regular entry. These patients were followed up for dietary assessment again between 4 and 6 weeks after initial dietary advice to monitor their compliance. Complete compliance was defined as adherence to a low FODMAP diet for 6 weeks, partial compliance was between 2 and 6 weeks, and noncompliance was less than 2 weeks adherence. Additional

advice was provided at follow up if they required further dietary restrictions. For patients who had reported symptom improvements, a gradual reintroduction of foods that contain FODMAP (up to their recommended threshold level, less than 10 g FODMAP) was then advised.¹⁴ A dietary education booklet about low FODMAP foods and practical tips to adhere to the dietary advice were provided as well.

All patients were contacted by telephone after a period of 3 months by a clinician (Z.Q.W.) to obtain information about their IBS symptom change. The primary outcome measure was symptom improvement at 3 months following the low FODMAP diet. This was based on a categorical yes/no response for each individual IBS symptom.

Local institutional ethical approval was obtained for the conduct of the study.

Results

A total of 16 patients with a clinical diagnosis of IBS were evaluated in this study. The characteristics of the patients were as follows: median age 67 ± 13.6 [inter-quartile range (IQR) = 60–71.8] years; female gender 10 (62.5%); and ethnic distribution: Chinese 8 (50%), Indian 5 (31.3%), and Malay 3 (18.8%). They were subclassified based on the ROME III criteria as follows: IBS-D $n = 8$ (50%), IBS-C $n = 1$ (6.3%), IBS-M $n = 3$ (16.8%), and IBS-U $n = 4$ (25%). Among this group of patients, 4 of 16 (25%) were noted to have an overlap of FD-IBS. The average duration of IBS symptoms was 36 ± 8 months prior to the commencement of a low FODMAP diet.

During the initial phase (i.e. 6 weeks), only 8 of 16 (50%) patients were able to comply with the low FODMAP diet; 4 (25%) partially complied, and a further 4 (25%) were not able to comply at all. Overall, 11 of 16 (68.8%) IBS patients reported an improvement of their symptoms, usually evident after 1 week of commencing the diet. Based on the predominant IBS symptom, improvement among all 16 patients (regardless of compliance with the diet) was reported as follows: abdominal pain 4 of 8 (50%), abdominal bloating/distention 8 of 14 (57.1%), and flatulence 8 of 12 (66.7%). Among patients who complied completely and partially with the low FODMAP diet, predominant symptom improvement was reported as follows: abdominal pain 3 of 5 (60%), abdominal bloating/distension 7 of 10 (70%), and flatulence 7 of 8 (87.5%).

Subgroup analysis between patients with IBS-D and those with non-IBS-D demonstrated a greater proportion of symptom improvement in the former, particularly with regard to stool form (Table 1). Ethnicity and gender did not appear to influence symptom improvement or compliance with a low FODMAP diet (Table 2). However, we observed that complete compliance with a low FODMAP diet had a higher rate of stool form improvement compared to noncompliance (87.5% vs. 33.3%, $P = 0.003$). Furthermore, the administration of GI pharmacotherapy did not seem to influence stool form improvement (Table 3).

Discussion

This small case series reporting on the efficacy of a low FODMAP diet in Asian patients with IBS has several notable observations. First, complete compliance with a low FODMAP diet for duration of 6 weeks in our patients was poor at 50%. This

Table 1 Comparing symptoms improvement among race, gender, and IBS subtypes after a low fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAP) diet ($n = 16$)

	Abdominal pain ($n = 4$)	<i>P</i> value	Stool consistency ($n = 8$)	<i>P</i> value	Bloating ($n = 8$)	<i>P</i> value	Flatulence ($n = 8$)	<i>P</i> value
Race								
Malay	0		1 (12.5%)		2 (25%)		2 (25%)	
Chinese	1 (25%)	0.272	4 (50%)	0.536	4 (50%)	0.247	4 (50%)	0.215
Indian	3 (75%)		3 (37.5%)		2 (25%)		2 (25%)	
Gender								
Male	1 (25%)	0.766	3 (37.5%)	0.766	4 (50%)	0.411	4 (50%)	0.587
Female	3 (75%)		5 (62.5%)		4 (50%)		4 (50%)	
IBS subtypes								
IBS_D	4 (100%)	0.064	7 (87.5%)	0.009	5 (62.5%)	0.076	5 (62.5%)	0.47
Non-IBS_D	0		1 (12.5%)		3 (37.5%)		3 (37.5%)	

IBS, irritable bowel syndrome.

compliance rate is significantly lower compared to previous reports from non-Asian studies,^{15–17} albeit the latter were mostly conducted in a clinical trial setting. However, among those who were able to comply, there was an excellent symptom response—60% improvement in abdominal pain, 70% improvement in abdominal bloating, and 87.5% reduction in flatulence. This is consistent with published data in Western case series, generally reporting a 70% overall symptom improvement in IBS patients while on a low FODMAP diet.^{15,18–20} Second, symptom response was best reported in the IBS-D group, which was in agreement with previous studies conducted in the West.^{15,20–22} The difficulties experienced by the noncompliant group were several, including: (i) low availability of low FODMAP food items in the local groceries/store, (ii) poor labeling of FODMAP content in Asian food items, and (iii) certain low FODMAP food items perceived to be costly.

To our knowledge, our report is the first to describe the efficacy of a low FODMAP diet among Asian IBS patients in a nonclinical trial setting. All of these patients had been suffering from IBS for at least 3 years or more, and >50% were still on pharmacotherapy. Although some of these patients were on proton pump inhibitors (PPI), which is not standard therapy for IBS, this was probably due to either (i) a mistaken diagnosis of dyspepsia by their clinician or (ii) overlapping functional dyspepsia and IBS. In any case, the patients' symptoms were not

responding to PPI therapy at the time of initiating the low FODMAP diet, further validating the efficacy of the low FODMAP diet. Furthermore, a recent multicenter survey of 1376 Asian IBS patients across 11 cities in Asia indicated that 57% of IBS patients were being treated with PPI therapy by their physicians,²³ suggesting that this is not an uncommon practice in Asia due to a lack of effective therapy for IBS.

A review article by the Monash group has explored the possibility of implementing a low FODMAP diet for South Asian IBS patients, a region with a similar diet pattern to ours. Hewawasam *et al.* have highlighted some of the following challenges that would be a barrier to the implementation of a low FODMAP diet in South Asia—poor knowledge of FODMAP content of local diet, potential of malnutrition with FODMAP restriction, poor labeling of packaged food ingredients, poor social acceptance of low FODMAP alternative foods, lack of dietetic expertise, poor English literacy, and lack of knowledge of the dietary literature.²⁴ We believe that many of these challenges are pertinent to the Malaysian scenario as well. The Malaysian diet is complex, as alluded to before,²⁵ and its FODMAP content has not been completely evaluated. Nevertheless, as many of the main food components of an Asian diet have already had their FODMAP content evaluated,¹² a restriction of these known

Table 2 Comparison of compliance according to race, gender, and irritable bowel syndrome (IBS) subtypes

	Compliant ($N = 12$)	Noncompliant ($N = 4$)	<i>P</i> value
Race			
Malay	2 (17%)	1 (25%)	0.915
Chinese	6 (50%)	2 (50%)	
Indian	4 (33%)	1 (25%)	
Gender			
Male	5 (42%)	1 (25%)	0.551
Female	7 (58%)	3 (75%)	
IBS subtypes			
IBS_D	7 (58%)	1 (25%)	0.248
Non-IBS_D	5 (42%)	3 (75%)	

Table 3 Improvement in stool form of irritable bowel syndrome (IBS) patients based on compliance with a low fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAP) diet and GI therapy

	Improvement n (%)	No improvement n (%)	<i>P</i> value
Compliance [†]			
Complete	7 (87.5)	1 (12.5)	0.003
Noncomplete	1 (33.3)	3 (67.7)	
GI therapy [‡]			
Yes	4 (44.4)	5 (55.6)	0.68
No	4 (57.1)	3 (43.9)	

[†]Compared between complete and noncomplete compliance only.

[‡]Gastrointestinal pharmacotherapy—either proton pump inhibitors (PPI) or Mebeverine.

components is sufficient to provide symptom relief—which is what we have observed in this case series.

There are several limitations to our report. The patients in this study may not have been entirely representative of the majority of IBS subjects in Malaysia. Demographically, they were older (mean age 64 years) than that reported in community studies.^{4,5} However, they were predominantly female, which is consistent with other reports. Half of our patients presented with IBS-D, whereas Lee *et al.* reported 58.3% of IBS-M, followed by IBS-C and then IBS-D; Tan *et al.* and Rajendra *et al.* both reported IBS-C predominance in their surveys.^{3–5} It is likely that our patients were more representative of IBS subjects who are medical consultants and anxious about an organic cause for their symptoms. Hence, their motivation to comply with a low FODMAP diet may not be entirely representative of the average IBS patient in Malaysia. In addition, the early learning curve of our dietary team may have affected the efficacy of a low FODMAP diet among our patients. As discussed before, with the lack of comprehensive FODMAP data in Asian foods, substitution of food items may have been inaccurate. Finally, our assessment of IBS symptoms was subjective in this study as we did not use a symptom severity assessment tool.

The Asian multicenter survey by the Rome Foundation Asian Working Team, mentioned above, has also demonstrated that almost half (46%) of Asian IBS patients who were consulting for their symptoms were dissatisfied with their treatment.²³ This is largely due to ineffective therapy for IBS in Asia. Despite some of the challenges highlighted in this article and by others, our report indicates that a low FODMAP diet is feasible and can be incorporated into the management of Asian IBS patients. However, compliance rates were low, and this requires further evaluation. We look forward to more “real-world” data in larger patient samples in Asia to confirm our observations.

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