

## Case Report

# Low-FODMAP diet on postprandial distress syndrome type of functional dyspepsia with mixed type of irritable bowel syndrome patient: A case report

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## Abstract

Functional dyspepsia is a complex collection of symptoms from the gastroduodenal, while irritable bowel syndrome (IBS) is a disease that chronically weakens gastrointestinal. The occurrences of both of these diseases are common; however, the new approach therapy introducing the low-FODMAP diet (low fructose, oligosaccharides, disaccharides, monosaccharides, and polyols) is rarely discussed. The aim of this case report was to present a case of functional dyspepsia with IBS mixed type treated with a low-FODMAP diet. A female 37 years old reported complaints of heartburn worsening over the last seven months. Based on IBS-symptom severity scale (IBS-SSS) assessment, the patient had 75% scale on belly pain and 50% abdominal distention, which interfered the daily activity significantly. The patient was diagnosed with functional dyspepsia subtype postprandial distress syndrome with IBS mixed type. In addition, the low-FODMAP diet was started immediately, together with pharmacological therapy (oral omeprazole and domperidone), and followed up each week. On the first week of evaluation, the patient was feeling much better as IBS-SSS assessment scores decreased, and the pharmacological therapy was stopped. On the second week of evaluation, the patient had no more complaints with IBS-SSS assessment markedly decreased. This case highlights that low-FODMAP diet could be a new approach therapy for IBS that could improve the IBS symptoms.

**Keywords:** Heartburn, dyspepsia, low-FODMAP diet, irritable bowel syndrome, treatment

## Introduction

Functional gastrointestinal disorders (FGIDs) are common unexplained gastrointestinal symptoms that are thought to arise from different locations of the digestive tract. Two of the recognized diseases are functional dyspepsia and irritable bowel syndrome (IBS) [1]. Functional dyspepsia is a complex collection of symptoms from the gastroduodenal part of the digestive tract and includes pain or burning sensation in the epigastrium, a feeling of fullness after eating, or an early feeling of fullness [2]. The prevalence of dyspepsia in the general population is approximately 20% [3]. However, 80% of these individuals have no explanation for their symptoms at endoscopy, therefore classified as functional dyspepsia [4]. Functional dyspepsia is categorized into two subtypes based on symptoms: (a) postprandial distress syndrome (PDS),



which is characterized by complaints of a disturbing early feeling of fullness and/or a feeling of fullness after eating, which occurs approximately three times in a week; and (b) epigastric pain syndrome (EPS) which is characterized by unpleasant epigastric pain and/or a burning sensation that occurs approximately once a week [5]. These diagnostic complaints must be consistent for three months, with the onset of symptoms persisting approximately six months before diagnosis [6]. On the other hand, IBS is a disease that chronically weakens gastrointestinal function affecting 9%–23% of the entire population in the world and IBS associated with a low quality of life [7]. Although the pathophysiology of IBS is still unclear [8], it is subclassified into different types, one of which is irritable bowel syndrome mixed type (IBS-M) [9]. IBS-M patients usually deal with episodes of both diarrhea and constipation. The changing nature of bowel symptoms can make finding strategies to relieve the symptoms difficult. Some studies reported that the prevalence of IBS in patients with PDS subtype of functional dyspepsia was higher than those with the EPS subtype [10-12].

Current treatment approaches for functional dyspepsia include eradication of *Helicobacter pylori* if the infection is present, acid suppression therapy, prokinetic drugs, and central neuromodulators. New therapeutic approaches for this condition are needed as an alternative to pharmacotherapy and to reduce the burden of treatment costs. Low-FODMAP diet (low fructose, oligosaccharides, disaccharides, monosaccharides, and polyols) was introduced as a new approach therapy for the IBS [13], fructose oligosaccharides, disaccharides, monosaccharides, and polyols are saccharides that are very difficult to digest and ferment, therefore triggering bloating and gas in the stomach. Some previous studies showed that low-FODMAP diet reduced the complaints in IBS patients [13-15]. Low-FODMAP diet consists of short-chain carbohydrate types of food such as lactose, fructose, galactooligosaccharides (such as fructan and galactose), and alcohol polysaccharides (such as sorbitol and mannitol) [16]. The aim of this case report is to present a case of a patient with PDS type of functional dyspepsia with IBS-M treated with low-FODMAP diet.

## Case

A female 37 years old visited Kebonsari Health Center, Surabaya, Indonesia, with a complaint of heartburn that had worsened over the last seven months. The complaint was recurrent and sometimes lessened with antacids and/or sucralfate, but recently had become more frequent and worse. The patient frequently visited the clinics for treatment, but the complaint has not improved. The complaint is also often accompanied by alternating difficulty defecating or diarrhea, which improved on its own without medication. The patient easily felt full after eating compared to last year, and therefore, the patient tended to reduce her food portions. No history of bleeding or previous complaints like the present time. The patient was married and had no children. She worked as a household assistant, with working hours from 11.00 to 16.00. The patient often consumed coffee and spicy food, but the patient had reduced it since the complaint became worse. The patient did not have meals regularly and often skipped meals; did not pay attention to the type of food consumed either; and tended to eat the food they were available. The patient did not have a good sleeping schedule either, often only sleeping for five hours a day. The patient had a hobby of watching, which led to inappropriate eating habits. No history of smoking or alcohol consumption.

On examination of vital signs, the patient was compos mentis, blood pressure 128/89 mmHg, pulse 98 times/min, oxygen saturation 98% room air, and respiratory rate 20 times/min. Anthropometric measurement showed a weight of 57 kg and height of 160 m; therefore, the body mass index (BMI) was 22.3 kg/m<sup>2</sup> (normal). Physical examination of the head and neck, thorax (lungs and heart), as well as upper and lower limbs showed normal findings. On abdominal examination, there was softness of the stomach wall on palpation, normal bowel sounds on auscultation, tympanic percussion, and no tenderness on palpation. Laboratory examination showed a slight decrease in mean corpuscular hemoglobin and indicated no significant clinical impact (**Table 1**).

Based on the history, physical examination, and supporting examinations, the working diagnosis of PDS type of functional dyspepsia with IBS-M was made. The patient was treated with oral omeprazole 20 mg per 24 h and oral domperidone 10 mg per 8 h. In addition, the therapy

was also combined with diet management by a nutritionist. The patient was also referred to a psychologist for further evaluation of psychological factors that may cause the complaint. The patient underwent a psychological examination using the Self-Reporting Questionnaire (SRQ-20) [17], which contained 20 questions related to the indication of a mental emotional disorder and the result was within normal limits (<6 points).

**Table 1. Laboratory results of the patient**

Parameter (unit)	Measured value	Normal value
Blood analysis		
Hemoglobin (g/dL)	14.9	12.1–15.1 (female)
Mean corpuscular volume (fL)	85.7	80–100
Mean corpuscular hemoglobin (pg)	22.7*	27.5–33.2
Mean corpuscular hemoglobin concentration (g/dL)	32.4	32–36
White blood cells ( $\times 10^3/\mu\text{L}$ )	5.5	3.9–9.7
Platelets ( $\times 10^3/\mu\text{L}$ )	255	150–450
Platelet (%)	0.22	0.22–0.24
Hematocrit (%)	45.9	36–48 (female)
Urine analysis		
pH	6.5	4.6–8.0
Specific gravity	1.025	1.005–1.030
Leukocyte	Negative	Negative
Protein	Negative	Negative
Erythrocyte	Negative	Negative
Ketone	Negative	Negative
Urobilinogen	Negative	Negative
Bilirubin	Negative	Negative

\*Lower than normal value

Pharmacological therapy with oral omeprazole 20 mg once daily and domperidone 10 mg every eight hours was started. The low-FODMAP was started immediately after consultation with the nutritionist. The patient was advised to consume the menu provided by a nutritionist and to change the lifestyle and sleep patterns. The recommended menu contained staple foods, animal-derived protein, vegetables, fruits, and snacks. The menu sets provided to the patient based on a low-FODMAP are presented in **Table 2**. On day 7 of the evaluation, the patient was feeling much better and the pharmacological therapy was stopped. The patient complaint improved even though the medication was stopped. The patient then repeated the consumption of the prescribed low-FODMAP menu for an additional seven days. On day 14 of evaluation, the patient reported having no symptoms. The IBS-symptom severity scale (IBS-SSS) [17] was assessed serially until day 14 of evaluation and the results are presented in **Table 3**. The IBS-SSS of the patient shows significant improvement throughout the assessment period.

**Table 2. Low-FODMAP diet recommended for the patient for two weeks**

Day (time)	Primary dish	Side dish (non-vegetable)	Side dish (vegetable)	Vegetable	Fruit	Snack
Day 1 (morning)	White rice*	Meat patties	Tempeh steak	Carrot soup*	Banana*	Rissole
Day 1 (afternoon)	White rice*	Chicken roulade	Steamed tofu	Spinach soup	Melon	Green bean soup
Day 1 (evening)	White rice*	Scramble egg	Orek tempeh	Stir-fried pok choy*	Papaya	-
Day 2 (morning)	White rice*	Fried parrot fish	Grilled tofu ball	Chayote soup*	Grape*	Summer squash pudding
Day 2 (afternoon)	White rice*	<i>Empal</i>	Tempeh <i>bacem</i>	Turnip soup	Orange*	Sausage
Day 2 (evening)	White rice*	Laos fried chicken	Tofu soy sauce	<i>Cah</i> carrot*	Melon	-
Day 3 (morning)	White rice*	Yellow spiced quail eggs	Yellow spiced tempeh	Carrot setup*	Papaya	<i>Lemper</i>
Day 3 (afternoon)	White rice*	Crispy snapper fish	Tofu ball	Vegetable soup	Banana*	Potato croquettes
Day 3 (evening)	White rice*	Soto	Fried tempeh	Lettuce*	Grape*	-

Day (time)	Primary dish	Side dish (non-vegetable)	Side dish (vegetable)	Vegetable	Fruit	Snack
Day 4 (morning)	White rice*	Brine chicken	Brine tofu	Sauté mustard greens	Banana*	Cake
Day 4 (afternoon)	White rice*	Omelet	Tempeh soy sauce	Sweet carrot* soup*	Orange*	Sweet potato compote
Day 4 (evening)	White rice*	Grilled gourami	Tofu <i>bacem</i>	Saute chayote*	Papaya	-
Day 5 (morning)	White rice*	<i>Rawon</i>	Fried tempeh	Lettuce*	Melon	Pukis
Day 5 (afternoon)	White rice*	Laos fried chicken	Tofu soy sauce	Carrot soup*	Grape*	<i>Salak</i> seed pulp
Day 5 (evening)	White rice*	Egg stew	Fried tempeh	<i>Cah</i> carrot*	Grape*	-
Day 6 (morning)	White rice*	Milkfish brains	Tofu ball	Stir-fried pok choy*	Papaya	Nagasari
Day 6 (afternoon)	White rice*	Meatball	Steamed tofu	Lettuce*	Melon	Steamed cake
Day 6 (evening)	White rice*	Grilled chicken	Tempeh <i>bacem</i>	<i>Cah</i> chayote*	Grape*	-
Day 7 (morning)	White rice*	Brine chicken	Brine tofu	Sauté mustard greens*	Banana*	Cake
Day 7 (afternoon)	White rice*	Soto	Fried tempeh	Lettuce*	Grape*	Sweet potato compote
Day 7 (evening)	White rice*	Laos fried chicken	Tofu soy sauce	<i>Cah</i> carrot*	Melon	-

\*Low FODMAP diet recommendation

**Table 3. Serial IBS-symptom severity scale assessment of the patient**

No	IBS-SSS Question	First examination	Day 7 of follow-up	Day 14 of follow-up
1	Do you currently suffer from abdomen or belly pain?	Yes	Yes	No
a	Indicate the severity of your abdomen or belly pain.	Severe (75%)	Quite severe (50%)	-
b	Enter the number of days that you typically experience abdominal pain every 10 days	5 to 10 days	1 to 10 days	-
2	Do you currently suffer from abdominal distension (bloating, swollen or tight tummy)?	Yes	No	No
a	Indicate the severity of your abdominal distension/tightness.	Quite severe (50%)	-	-
3	Indicate how satisfied you are with your bowel habits.	Somewhat satisfied (66.6%)	Very satisfied (100%)	Very satisfied (100%)
4	Indicate how much your IBS affects or interferes with your life in general.	Quite a lot (66.6%)	Not much (33.3%)	Not at all interferes (0%)

## Discussion

Based on the ROME IV criteria, the definition of functional dyspepsia is complaints of feeling full after eating, feeling full early, epigastric pain, and a burning sensation in the epigastrium, which is enough to interfere with activities, that was experienced for approximately three days per week for three months with an onset of approximately six months [6]. These criteria met our patient, who had heartburn that had worsened over the last seven months. In this patient, no comorbidities other than gastrointestinal diseases were reported, proven by the results of physical and supporting examinations. Psychological screening was conducted on this patient using the SRQ-20 to exclude any psychological factor that might trigger the functional dyspepsia and IBS. A previous study also conducted a similar approach by using the hospital anxiety and depression scale (HADS) to investigate any and severity of anxiety and depression in IBS patients [13].

FODMAP is a broad class of tiny, highly fermentable, osmotically capacitous carbohydrates that are little or non-digestible. They can aggravate the symptoms of IBS by creating short-chain fatty acids (SCFA), colonic gas, and an increase in the amount of water in the small intestine.

Through the control of mastocyte activity, SCFA can also affect intestinal motility, the absorption of water and sodium, histamine release, and visceral sensitivity [18,19]. Reducing the FODMAP consumption might be a therapeutic choice for IBS patients. A strict low-FODMAP diet entails a 4-to 8-week reduction in FODMAP intake, followed by a gradual reintroduction based on individual tolerance, allowing for long-term customizing of the diet [13]. However, a trained and experienced nutritionist must continuously supervise the reintroduction phase to guarantee nutritional sufficiency over the long run [20].

Low-FODMAP diet have proven to improve IBS symptoms in a recent meta-analysis, as it was the most effective among the dietary interventions [21]. A study found a 50% decrease in severity based on the IBS-SSS assessment after low-FODMAP program [13]. In this patient, the severity of belly pain reduced from 50% to 0% in two weeks after low-FODMAP. The impact on gastrointestinal symptoms was the most significant factor influencing symptom improvement and even the IBS patient's quality of life [22]. In the medium and long term, many of the assessed indicators showed a considerable improvement according to IBS patients [13]. Although our patient was off medical drug, the patient's complaint improved by low-FODMAP only and this result is in line with a previous study [23]. However, since it is an exclusion diet, critics of the low-FODMAP pose doubts regarding its nutritional adequacy, complexity, and efficacy, mainly linked to supposed poor compliance for the long-term [18]. Another concern is nutritional adequacy. A study suggests that the low-FODMAP is not adequate for daily nutritional needs [24]. However, this was refuted by some studies, which suggest low-FODMAP nutritional adequacy is sufficient and still the most efficient diet therapy for IBS [13,21,25].

## Conclusion

We presented a case of PDS type of functional dyspepsia with IBS-M. By avoiding non-digestible food (having low-FODMAP diet), the symptoms of the patient improved significantly, even after the medication had been stopped. This case highlights that the low-FODMAP could be a new approach therapy for IBS that has proven to significantly improve IBS symptoms.

## Ethics approval

Written informed consent has been provided by the patient for publication purposes with document number 015783/Kebonsari/2024.

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## Competing interests

All the authors declare that there are no conflicts of interest.

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## Underlying data

Derived data supporting the findings of this study are available as part of the article.

## How to cite

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