

# Dietary Therapies in IBS: An Update



Christian Shaw, Trainee ACP and Specialist Gastroenterology Dietitian, and Rachel Buckle, Trainee ACP and Specialist Gastroenterology Dietitian, Academic Unit of Gastroenterology, Sheffield Teaching Hospitals NHS Foundation Trust

Irritable Bowel Syndrome (IBS) is a disorder of gut brain interaction (DGBI) with a reported global prevalence of around 4%.<sup>1</sup> The pathophysiology is not fully understood, but thought to involve visceral hypersensitivity, gut dysmotility, immune dysregulation and alterations in the gut microbiome.<sup>2</sup> The current ROME IV diagnosis criteria, indicates there must be abdominal pain at least once per week, which is associated with two of the following; related to defecation, stool frequency or stool consistency.<sup>3</sup> Symptom onset must be at least six months prior, with symptoms present in the last three months.

The current treatment includes medical management, dietary therapies and psychological support,<sup>4</sup> with dietary interventions being most patients preferred approach.<sup>5</sup> Guidelines advocate a two stepped approach, including traditional dietary advice (TDA) often referred to as 'first line' advice,<sup>6,7</sup> followed by a low fermentable oligo-, di-, mono-saccharides and polyols diet or FODMAP diet (LFD), as 'second line' which involves three stages; restriction, reintroduction and personalisation. The British Society for Gastroenterology (BSG) guidelines promote access to dietary advice early into the treatment course and that the LFD should be delivered by a dietitian.<sup>4</sup>

## Evidence for dietary therapies

Previous research supports the use of TDA, with a response rate of up to 54% and the LFD at up to 76%.<sup>8,11-14</sup> Furthermore, several studies have set out to compare TDA advice with the LFD at short term follow up, with only two studies showing a significantly better response rate with the LFD.<sup>11-14</sup> Inconsistencies in delivery of TDA may contribute to these mixed findings. Böhn and colleagues showed no significant difference in response between TDA and LFD at four weeks follow up.<sup>12</sup> However, those in the TDA group were advised to

avoid onion, cabbage and beans which is likely to reduce FODMAP intake and creates an overlap between TDA and LFD. More recently Goyal et al showed a higher number of responders, with the LFD at 62.7% compared with 40.8% following TDA, which was based on NICE and BDA recommendations and did not include a reduction in onion, cabbage and beans.<sup>6,7,14</sup>

Long term data on TDA is limited to a single study at four months follow up, whereas a number of studies exist exploring the LFD at long term follow up.<sup>14-16</sup> Goyal et al observed a significantly better clinical response rate with the LFD following reintroduction, compared to the TDA at four months (52.9% vs. 30.6%).<sup>14</sup>

The most recent study to explore the LFD at long term follow up was from the Sheffield Gastroenterology group, published in 2021.<sup>16</sup> This is the largest multicentre study on the long-term effects of the low FODMAP diet including 205 patients. At up to eight years follow up, 60% of patients using the LFD had adequate symptom relief. Symptom response was better with higher self-reported adherence, with 68% with strict adherence having relief compared with only 13% with major lapses from the diet, suggesting adherence is important.



Sponsored content: This article has been commissioned and placed by Dr Schär. CN had no input into the content or reviewing of this article. This article is intended for healthcare professionals only.

Debate exists about the role of gluten in IBS management with current guidelines not making recommendations due to a lack of studies.<sup>4, 9, 10</sup> Previous RCTs have shown the GFD to be effective at managing IBS symptoms in the short term with a lack of data on the long term efficacy.<sup>17-21</sup> Humans lack the ability to break the fructose-fructose bonds in fructans and it should not be surprising their ingestion may contribute to symptoms in IBS, given they escape absorption in the small intestine and undergo colonic fermentation.<sup>22, 23</sup> As wheat based products are the largest contributor of fructans in the UK diet, using GF products may reduce total fructan intake, as they contain lower quantities compared to gluten containing alternatives.<sup>24, 25</sup> This may be driving symptom relief in some individuals with IBS. The evidence for symptom generation by fructans is supported by double blind food challenge trials.<sup>26</sup> However, wheat is complex and there are several other components that may be triggering symptoms in IBS, such as gluten, amylase trypsin inhibitors and wheat germ agglutinins.<sup>27, 28</sup> A fructan reduction or fructan free diet is not terminology known to patients, but gluten free (GF) is well known given its global popularity and use by IBS patients.<sup>16</sup> Therefore, following a GFD may be a route to reducing fructan intake and managing IBS symptoms.

### Uncertainties of the LFD

Although the LFD results are promising, it requires a significant investment of patient time, as it can take four-to-six months to complete all three stages of the diet.<sup>29</sup> It is also challenging to implement, as only 65% can follow all three stages appropriately even if seen by a dietitian, with a figure much lower at 29% if the advice was given without dietetic involvement.<sup>30</sup> Although first line advice is considered easier to follow, no studies have measured compliance to the diet.

During the restriction phase of the LFD over the duration of four-to-eight weeks, total FODMAP intakes decrease dramatically.<sup>31</sup> Whether an optimal level of FODMAP restriction exists is unclear. Most studies achieved total FODMAP intakes <12 g/day during the restriction stage, which has been suggested as the therapeutic threshold of benefit, but has yet to be validated. With dietetic involvement 79% achieved this level, compared to 39% without.<sup>30</sup>

Interestingly, at long term follow up after the reintroduction of FODMAPs to tolerance, total FODMAP intakes are much higher than 12 g/day, usually above 17 g/day and symptom benefit remains.<sup>15, 16, 32</sup> For example, a study from King's College London, showed total FODMAP intakes at long term follow up were 20.6 g/day and 57% of patients reported adequate symptom relief.<sup>15</sup> This suggests that it may not be necessary to restrict total FODMAPs to levels as low as 12 g/day. Bottom-up approaches, such as single FODMAP exclusions or FODMAP 'gentle' may be alternatives that have yet to be explored. The FODMAP 'gentle' diet has been described by the Monash group, but no data currently exists on its efficacy.<sup>33</sup> This approach may already be being used in practice, but further research is needed.

Whether individual FODMAPs such as fructans have an optimal threshold of restriction is not known. The Sheffield Gastroenterology group observed at long term follow up, 68% of patients on a personalised LFD use GF or wheat-free products and 43% follow this diet when eating out.<sup>16</sup> The factors driving these dietary behaviours are unclear but may be due to habit, an increased societal awareness of these products, or symptom response.

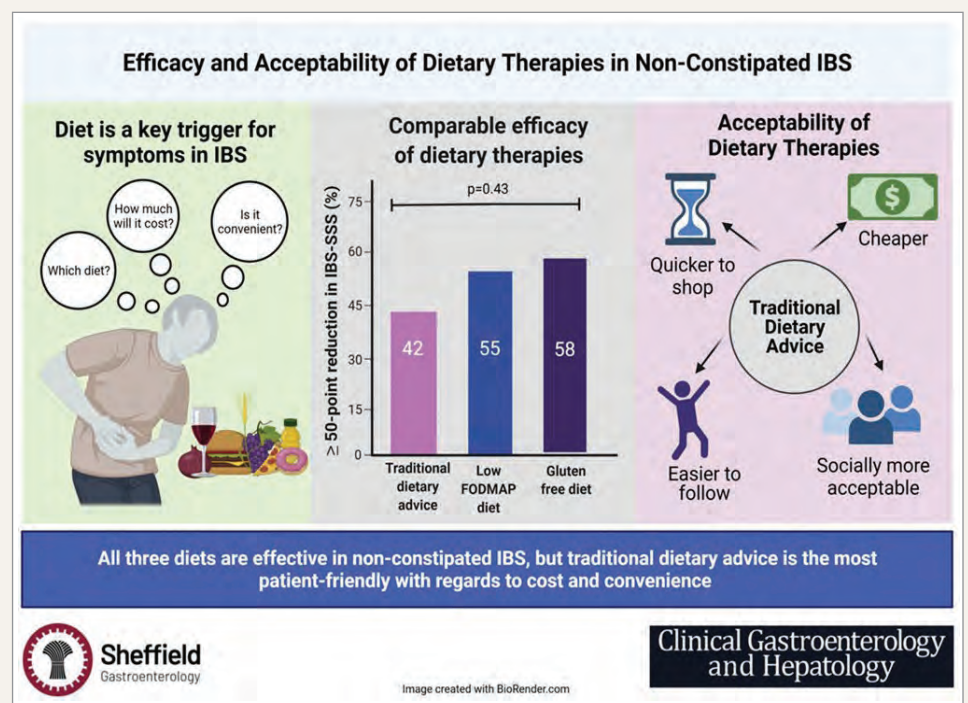
### The first head-to-head trial including the GFD

Previously no direct head-to-head trials had been conducted comparing TDA,

GFD and LFD. Given the widespread use of dietary therapies in IBS further research was needed to help support patients and dietitians in choosing the best approach for each individual. In response, the Sheffield Gastroenterology group conducted the first randomised control trial comparing TDA, LFD and the GFD. Ninety-nine patients with non-constipated IBS were randomised to one diet for a four-week intervention period. Traditional dietary advice was given as per BDA guidelines and the GFD was adapted for IBS where all cereal grains containing gluten were avoided, but cross contamination was permitted.<sup>7</sup> Advice for each diet was delivered in a group setting by FODMAP trained senior gastroenterology dietitians with a clinical interest in IBS. Initially these sessions were delivered face-to-face but due to COVID-19, delivery was changed to online groups. Clinical response was explored using the IBS Symptom Severity Scale (IBS-SSS) and additional questionnaires explored mood and food-related quality of life.

The primary outcome was clinical response (defined as a 50-point reduction in the IBS-SSS). This was achieved by 42% of patients who received TDA, 55% for LFD and 58% for GFD. The difference between the groups was not significant (p=0.43), indicating all three dietary therapies were equally effective and should be considered as management options for patients with IBS (see **Figure 1**).

Figure 1: Response rate to dietary therapies



Much of the previous literature has focused on the efficacy of the LFD, however this can be challenging to implement.<sup>30</sup> The relative simplicity of TDA was highlighted in this research being less time consuming, easier to follow when eating out and cheaper than both the GFD and LFD. Both the GFD and TDA were easier to incorporate into patients' lives than the LFD. Despite the differences most patients from all groups reported they would consider continuing the allocated diet.

Concerns have been raised about the long-term impact of dietary therapies on nutritional adequacy for individuals with IBS.<sup>34</sup> However, even prior to dietary therapies previous research has identified lower quality habitual diets in individuals with IBS.<sup>35</sup> Supporting this idea, Sheffield Gastroenterology group noted that even prior to dietary therapies most patients were not meeting the DRV for energy intake. Following dietary therapies, the proportion of patients meeting DRVs for macronutrients did not differ between the different treatment arms. However, micronutrients differences were seen, with lower levels of potassium and iron with TDA and also with thiamine and magnesium with LFD and GFD.

Evaluation of dietary FODMAP content showed where the LFD led to a reduction in all FODMAP components and the greatest reduction in overall FODMAPs, both TDA and GFD led to a significant reduction in overall FODMAPs, but only from specific components. Given the comparable efficacy, this suggests that these alternative approaches may sufficiently reduce FODMAPs to a therapeutic level without the requirement for more complex or restrictive approaches.

Guidelines advocate for dietetic involvement when implementing the LFD.<sup>4</sup> Previous research from the Sheffield Gastroenterology group identified the inequity in access to specialist gastroenterology dietetic services with regional differences in numbers, access to specialist clinics and long wait times to access dietetic support.<sup>36</sup> To manage demand some services (34%) are already using group education in IBS, which has shown promising results.<sup>37</sup> Centres are beginning to use webinars to improve access, but the efficacy of this has not been compared to face-to-face delivery.<sup>38</sup> Interestingly, we saw no difference in number of responders when moving to online delivery due to COVID-19. Although further research is needed, this highlights the opportunity that technology provides to support the management of IBS.

## Conclusion

Dietary therapies are a popular management option with patients for IBS and increasing research supports their efficacy. Individually the options for dietary therapies have been studied, but head-to-head trials are lacking. This RCT showed that TDA, GFD and LFD were equally effective in symptom management. All dietary therapies appear to reduce total FODMAP intake to differing degrees, highlighting the potential to use TDA and GFD as a bottom-up approach to FODMAP reduction. TDA had a lower impact on food related quality of life and appears easier to implement and incorporate into daily life, therefore, should still be considered as a first line approach. Given the equal efficacy of both the GFD and LFD these should be considered as second line options, guided by patient choice and where possible dietetic support.

“Dietary therapies are a popular management option with patients for IBS and increasing research supports their efficacy.”

References: 1. Sperber AD, et al. (2021). Worldwide Prevalence and Burden of Functional Gastrointestinal Disorders, Results of Rome Foundation Global Study. *Gastroenterology*;160(1): 99-114. 2. Drossman DA. (2016). Functional Gastrointestinal Disorders: History, Pathophysiology, Clinical Features, and Rome IV. *Gastroenterology*;150(6): 1262-1279.e2. 3. Lacy BE, et al. (2016). Bowel Disorders. *Gastroenterology*;150(6): 1393-1407. 4. Vasant DH, et al. (2021). British Society of Gastroenterology guidelines on the management of irritable bowel syndrome. *Gut*;70(7): 1214-40. 5. Sturkenboom R, et al. (2022). Discrete Choice Experiment Reveals Strong Preference for Dietary Treatment Among Patients With Irritable Bowel Syndrome. *Clin Gastroenterol Hepatol*; doi:10.1016/j.cgh.2022.02.016. 6. NICE (2008). Irritable bowel syndrome in adults: diagnosis and management of irritable bowel syndrome in primary care. Full guidance. Accessed online: [www.nice.org.uk/guidance/cg61](http://www.nice.org.uk/guidance/cg61) (Accessed 14th April 2022). 7. McKenzie YA, et al. (2016). British Dietetic Association systematic review and evidence-based practice guidelines for the dietary management of irritable bowel syndrome in adults (2016 update). *J Hum Nutr Diet*; 29(5): 549-75. 8. Rej A, et al. (2018). Clinical Application of Dietary Therapies in Irritable Bowel Syndrome. *JGLD*; 27(3): 307-16. 9. Lacy BE, et al. (2021). ACG Clinical Guideline: Management of Irritable Bowel Syndrome. *Am J Gastroenterol*; 116(1):17-44. 10. Moayyedi P, et al. (2019). Canadian Association of Gastroenterology Clinical Practice Guideline for the Management of Irritable Bowel Syndrome (IBS). *J Can Assoc Gastroenterol*; 2(1): 6-29. 11. Staudacher HM, et al. (2011). Comparison of symptom response following advice for a diet low in fermentable carbohydrates (FODMAPs) versus standard dietary advice in patients with irritable bowel syndrome: IBS symptom response to a low FODMAP diet. *J Hum Nutr Diet*; 24(5): 487-95. 12. Böhn L, et al. (2015). Diet Low in FODMAPs Reduces Symptoms of Irritable Bowel Syndrome as Well as Traditional Dietary Advice: A Randomized Controlled Trial. *Gastroenterology*; 149(6): 1399-1407. 13. Eswaran SL, et al. (2016). A Randomized Controlled Trial Comparing the Low FODMAP Diet vs. Modified NICE Guidelines in US Adults with IBS-D. *Am J Gastroenterol*; 111(12): 1824-32. 14. Goyal O, et al. (2021). Low fermentable oligosaccharide, disaccharide, monosaccharide, and polyol diet in patients with diarrhea-predominant irritable bowel syndrome: A prospective, randomized trial. *J Gastroenterol Hepatol*; 36(8): 2107-15. 15. O'Keefe M, et al. (2018). Long-term impact of the low-FODMAP diet on gastrointestinal symptoms, dietary intake, patient acceptability, and healthcare utilization in irritable bowel syndrome. *Neurogastroenterol Motil*; 30(1): e13154. 16. Rej A, et al. (2021). The low FODMAP diet for IBS: A multicentre UK study assessing long term follow up. *Dig Liver Dis*; 53(11): 1404-11. 17. Biesiekierski JR, et al. (2011). Gluten Causes Gastrointestinal Symptoms in Subjects Without Celiac Disease: A Double-Blind Randomized Placebo-Controlled Trial. *Am J Gastroenterol*; 106(3): 508-14. 18. Vazquez-Roque MI, et al. (2013). A Controlled Trial of Gluten-Free Diet in Patients With Irritable Bowel Syndrome-Diarrhea: Effects on Bowel Frequency and Intestinal Function. *Gastroenterology*; 144(5): 903-911. 19. Shahbazkhani B, et al. (2015). Non-Celiac Gluten Sensitivity Has Narrowed the Spectrum of Irritable Bowel Syndrome: A Double-Blind Randomized Placebo-Controlled Trial. *Nutrients*; 7(6): 4542-54. 20. Zanwar VG, et al. (2016). Symptomatic improvement with gluten restriction in irritable bowel syndrome: a prospective, randomized, double blinded placebo controlled trial. *Intest Res*; 14(4): 343. 21. Rej A, et al. (2022). Efficacy and Acceptability of Dietary Therapies in Non-Constipated Irritable Bowel Syndrome: A Randomized Trial of Traditional Dietary Advice, the Low FODMAP Diet, and the Gluten-Free Diet. *Clin Gastroenterol Hepatol*; doi:10.1016/j.cgh.2022.02.045. 22. Gibson GR, et al. (2004). Dietary modulation of the human colonic microbiota: updating the concept of prebiotics. *Nutr Rev Res*; 17(2): 259-75. 23. Wang XJ, et al. (2019). Review article: biological mechanisms for symptom causation by individual FODMAP subgroups - the case for a more personalised approach to dietary restriction. *Aliment Pharmacol Ther*; 50(5): 517-29. 24. Dunn S, et al. (2011). Validation of a food frequency questionnaire to measure intakes of inulin and oligofructose. *Eur J Clin Nutr*; 65: 402-408. 25. Varney J, et al. (2017). FODMAPs: food composition, defining cutoff values and international application: Defining and adapting the low-FODMAP diet. *Gastroenterol Hepatol*; 32: 53-61. 26. Skodje GI, et al. (2018). Fructan, Rather Than Gluten, Induces Symptoms in Patients With Self-Reported Non-Celiac Gluten Sensitivity. *Gastroenterology*; 154(3): 529-539. 27. Junker Y, et al. (2009). Wheat amylase trypsin inhibitors drive intestinal inflammation via activation of toll-like receptor 4. *Exp Med*; 209(13): 2395-408. 28. de Punder K, Pruimboom L. (2013). The Dietary Intake of Wheat and other Cereal Grains and Their Role in Inflammation. *Nutrients*; 5(3): 771-87. 29. Whelan K, et al. (2018). The low FODMAP diet in the management of irritable bowel syndrome: an evidence-based review of FODMAP restriction, reintroduction and personalisation in clinical practice. *J Hum Nutr Diet*; 31(2): 239-55. 30. Rej A, et al. (2021). What is the optimal FODMAP threshold in IBS? *J Gastroenterol Hepatol*; 36(6): 1723-5. 31. Tuck CJ, et al. (2022). Reed DE, Muir JG, Vanner SJ. Implementation of the low FODMAP diet in functional gastrointestinal symptoms: A real-world experience. *Neurogastroenterology & Motility* [Internet]. Accessed online: <https://onlinelibrary.wiley.com/doi/10.1111/nmo.13730> (April 2022). 32. Halmos EP, Gibson PR. (2019). Controversies and reality of the FODMAP diet for patients with irritable bowel syndrome. *J Clin Gastroenterol*; 34(7): 1134-42. 33. Hill P, et al. (2017). Controversies and Recent Developments of the Low-FODMAP Diet. *Gastroenterol Hepatol*; 13(1): 36-45. 34. Staudacher HM, et al. (2020). Nutrient Intake, Diet Quality, and Diet Diversity in Irritable Bowel Syndrome and the Impact of the Low FODMAP Diet. *J Acad Nutr Diet*; 20(4): 535-547. 35. Joyce T, et al. (2013). PTH-159 Group Education is as Effective as one-to-one Sessions when Administering the Low FODMAP Diet in Functional Bowel Disorders. *Gut*; doi:10.1136/gutjnl-2013-304907.646. 36. Williams M, et al. (2020). Feasibility, acceptability and cost efficiency of using webinars to deliver first-line patient education for people with Irritable Bowel Syndrome as part of a dietetic-led gastroenterology service in primary care. *J Hum Nutr Diet*; 33(6): 758-766.



Sponsored content: This article has been commissioned and placed by Dr Schär. CN had no input into the content or reviewing of this article. This article is intended for healthcare professionals only.