

A primer on common supplements and dietary measures used by patients with inflammatory bowel disease

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Abstract: Inflammatory bowel disease (IBD) is a chronic disease of the intestines. The pathophysiology of IBD, namely Crohn's disease and ulcerative colitis, is a complex interplay between environmental, genetic, and immune factors. Physicians and patients often seek complementary and alternative medicines (CAMs) as primary and supplementary treatment modalities. CAMs in IBD span a wide range of plants, herbs, pre/probiotics, and include formulations, such as cannabis, curcumin, fish oil, and De Simone Formulation. Dietary measures are also used to improve symptoms by attempting to target trigger foods and reducing inflammation. Examples include the specific carbohydrate diet, the Mediterranean diet, and a diet low in fermentable oligo-, di- and monosaccharides as well as polyols (FODMAP). We examine and review the most common complementary supplements and diets used by patients with IBD.

Keywords: alternative therapy, complementary supplements, Crohn's disease, diet, inflammatory bowel disease, ulcerative colitis

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Introduction

Inflammatory bowel disease (IBD) is a complex disease thought to have pathophysiology rooted in autoimmune, genetic, and environmental etiologies.¹ Physicians and patients often seek complementary and alternative medicines (CAMs) to treat disease and ameliorate symptoms.^{2,3} CAM supplements in IBD span a wide range of plants, herbs, and pre/probiotics. Dietary measures are also employed by patients seeking to improve symptoms by eliminating trigger foods and reduce inflammation. Unfortunately, physicians are often at a loss to guide patients in their use of these supplements and diets as there is little rigorous data to support many of these complementary therapies.

Herbal medicines have only been considered 'alternative' in recent centuries with the advent of modern medicine and development of the scientific method.⁴ For centuries, herbal and traditional medicines were used to manage a variety of ailments.^{4,5} CAM have been used to treat IBD for

decades, with or without physician knowledge and input.^{2,3,6} Up to 60% of patients with IBD have been reported to use CAM and less than half of these report use to physicians.^{3,7,8}

CAM users are typically female, dissatisfied with conventional therapies, and are seeking means to improve symptoms.⁷ Dissatisfaction with the physician-patient relationship and the use of CAM by family and friends have been found to be associated with increased CAM use.⁹ Many patients are motivated to use CAM based on a perception that they are natural and therefore carry less risk and fewer side effects. Some literature suggests association of CAM use with higher education and income levels, although data are conflicting.^{7,8,10} CAM users tend to have lower levels of compliance with and a tendency to discontinue conventional therapy.^{8,11} CAM use has been found to be used at similar rates in both Crohn's disease (CD) and ulcerative colitis (UC).

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Without a proper understanding of the studies behind CAM use in IBD, counseling can become difficult. It is imperative for physicians managing IBD to understand the risks and benefits of using CAMs to manage IBD in either supplementary or solitary means. Research on CAM in IBD spans a range in quality and is presented here in an updated and methodical manner of commonly used therapies (Table 1). This review is by no means exhaustive as the number and type of

Table 1. Summary of CAMs in IBD.

CAMs	Summary of evidence in IBD	Recommended for IBD	References
<i>Cannabis</i> (Marijuana)	UC: Improved QOL, no difference in induction or maintenance of remission CD: Improved CDAI and QOL; however, no difference in endoscopic/clinical remission	No	12–19
<i>Curcumin</i> (Turmeric)	UC: Effective in inducing and maintaining endoscopic remission when used in conjunction with 5-ASA; improved inflammatory markers CD: One study showed improved CDAI in mild to moderate disease	Possibly in UC	20–26
De Simone Formulation (previously known as VSL#3)	UC: Effective in inducing and maintaining remission with 5-ASA or IMM Pouchitis after IPAA: Effective in inducing and maintaining remission CD: Limited data to support use	Possibly, in UC and pouchitis	27–30
Fish oil	UC: May decrease fecal calprotectin and reduce corticosteroid requirements. However, it has not been shown to be more effective than placebo in maintaining remission CD: No difference in prevention of relapse	No	31–35
<i>Andrographis paniculata</i>	UC: One study showed similar endoscopic response as compared with mesalamine at 8 weeks in mild/moderate disease CD: No evidence to support use	Possibly, in UC	36,37
<i>Indigo Naturalis</i> (Compound Huangdai)	UC: One study showed superiority in endoscopic healing compared with placebo at 8 weeks CD: No evidence to support its use	Possibly in UC; however, limited by adverse effect of PAH	38–40
<i>Triticum aestivum</i> (Wheat grass)	UC: One RCT showed improved clinic disease scores after 1 month CD: No evidence to support its use	No	41
<i>Aloe vera</i>	UC: Improved clinical response compared with placebo CD: No evidence to support its use	No	42–45
<i>Boswellia serrata</i>	UC: Similar rates of remission when compared with sulfasalazine in nonrandomized studies CD: No difference compared with placebo in one RCT	No	46–48
<i>Artemisia absinthium</i> (Wormwood)	UC: No evidence to support its use CD: Improved CDAI; reduced corticosteroid requirements	No	49

5-ASA: 5-aminosalicylic acids; CD, Crohn's disease; CDAI, Crohn's disease activity index; IBD, inflammatory bowel disease; IMM: immunomodulators; IPAA: ileal pouch-anal anastomosis; PAH: pulmonary arterial hypertension; QOL: quality of life; RCT: randomized controlled trial; Ref.: references; UC: ulcerative colitis.

supplements used are considerable. It should be noted that poor quality data or ‘lack of evidence’ does not necessarily equate to ineffective therapy. CAM research is limited by lack of standardization in formulations and a dearth of high-quality randomized controlled trials (RCTs). Developing robust trials to study CAM, particularly in mild-to-moderate IBD, is difficult given nonstandardized dosing, numerous confounders, and an imperfect correlation between symptoms and disease activity. Studies with animal models of colitis often do not translate well to human models. In this review, we will give an overview of the most common complementary supplements and diets used by patients with IBD.

Complementary supplements

Cannabis

Marijuana is produced from the plant *Cannabis sativa*. There are many cannabinoid compounds; however, cannabis has two main receptors, Cannabinoid receptors 1 and 2 (CB1, CB2).⁵⁰ These receptors are found within the gut wall and enteric nervous system. Experimental studies in animals have found alterations in the endocannabinoid system to affect development of colitis.⁵¹ Given recent changes in legalization, availability, and patient interest, there have been several studies looking at the effect of cannabis use on IBD outcomes. Furthermore, up to 17% of IBD patients in some studies have reported the use of cannabinoid products.¹²

In a small RCT of 19 patients with a Crohn’s disease activity score (CDAI) >200, cannabidiol was found to be safe, but not effective in treating CD.¹³ The CDAI in the treatment arm was 220, and 216 in the control arm after 8 weeks of treatment. Clinical symptoms improved on the Likert-type scale.¹³ A later RCT by the same authors found improved CDAI and QOL scores 8 weeks after treatment with CBD-rich cannabis oil.¹⁴ CDAI improved from 282 to 166 in the cannabis arm ($n=30$) and from 264 to 237 in the placebo arm ($n=26$) ($p<0.05$). However, endoscopic scores and inflammatory markers remained unchanged. This study highlights the discrepancy often observed in IBD trials between clinical and endoscopic improvements.¹⁴

A trial of 60 patients with mild-to-moderate UC (Mayo score of 4–10) on stable 5-aminosalicylic

acid (5-ASA) dosing randomized to CBD-rich capsules *versus* placebo-evaluated clinical remission (Mayo score of ≤ 2 , with no subscore > 1). At the end of the 10 weeks trial, there was no significant difference between groups [odds ratio (OR): 0.82, 95% confidence interval (CI): 0.29–2.31, $p=0.753$], although compliance was lower in the CBD group. In a per-protocol analysis, there was a tendency to remission in the CBD group but the difference was not significant (OR = 1.3, 95% CI: 0.42–4.04, $p=0.703$).¹⁵

A recent meta-analysis of 20 studies, including five RCTs, found that cannabinoids were not effective in inducing remission [risk ratio (RR) = 1.56, 95% CI: 0.99–2.46] or lowering inflammatory biomarkers.¹⁶ However, clinical symptoms including abdominal pain, general well-being, nausea, diarrhea, and poor appetite were found to be improved.

Side effects and issues with marijuana are not entirely benign, as often perceived by the general public. Marijuana’s side effects include not only nausea and vomiting but its use also has been associated with an increased risk in the development of psychosis in multiple studies.^{17–19}

Overall, recent literature has shed little light on the prior, rather conflicting reports and low-quality data surrounding marijuana use in IBD patients. It remains difficult to recommend its use based on any high-quality evidence.

Curcumin/turmeric

Turmeric (*Curcuma longa*) and its active ingredient curcumin have been touted for centuries for its purported anti-inflammatory properties and have thus been a popular supplement in both the study and treatment of IBD.⁵² Studies in mice have shown reduced histologic evidence of inflammation with curcumin use.²⁰ Curcumin use in conjunction with 5-ASA has been shown to have higher rates of inducing and maintaining endoscopic remission in UC.^{21,22} In one placebo-controlled, double-blind, randomized study of 50 patients with mild-to-moderate UC, 38% of patients treated for 1 month with mesalamine and curcumin compared with 0% with mesalamine and placebo achieved endoscopic remission defined as a partial Mayo score < 2 (OR: 20.7; 95% CI: 1.1–393; $p=0.043$) at week 4.²¹ In another RCT of 89 patients with quiescent UC

randomized to curcumin and mesalamine/sulfasalazine *versus* placebo and mesalamine/sulfasalazine, 4.65% relapsed after 6 months in the curcumin compared with 20.51% in the placebo arm ($p=0.4$).²² A small double-blind RCT of 70 patients with mild-to-moderate UC on curcumin 1500 mg *versus* placebo found at 8 weeks, improved high sensitivity C-reactive protein (CRP) (13.6 *versus* 11.6 $\mu\text{g/ml}$; $p=0.01$), erythrocyte sedimentation rate (ESR) (2.7 *versus* 2.4 mm/h; $p=0.02$), and clinical indices.²³ An RCT of 69 patients with mild-to-moderate UC looking at a novel hydrophilic curcumin with mesalamine compound compared with placebo with mesalamine, found significantly improved endoscopic remission in the treatment arm in the per-protocol analysis (83.3% *versus* 6.25%, $p<0.001$), and in the intention to treat analysis (44% *versus* 5.71%, $p<0.001$).²⁴

Recently, data from a randomized, double-blind study in Japan have shown a reduction in clinical disease in mild-to-moderate CD (CDAI score ≥ 180 but < 450) with curcumin use.²⁵ The Theracurmin, which is a derivative of curcumin, was shown to reduce CDAI at 12 weeks from 211 to 149 in the treatment arm *versus* 211 to 203 in the placebo arm ($p=0.035$). Clinical remission, defined as a simple endoscopic score for CD (SES-CD) less than equal to 4, was achieved in 15% of the theracurmin arm compared with 0% in placebo; however, this result was not statistically significant ($p=0.22$).²⁵

Turmeric use can lead to mild symptoms, such as gassiness, and overall has a relatively favorable side effect profile. Although it has been known to cause mild liver test abnormalities, there have been a recent rise in reported cases of acute liver injury with curcumin use.²⁶ A recent case report suggested possible anti-coagulant effects, increased bleeding risk, and elevation in international normalized ratio (INR) with supplemental curcumin use in an IBD patient undergoing colonoscopy.⁵³ Curcumin may be a useful adjunct to conventional therapy in IBD, particularly UC.

Probiotics

The De Simone Formulation (DSF), previously known as VSL#3, is a probiotic which consists of eight bacterial strains: four strains of *Lactobacillus* (*Lactobacillus acidophilus*, *Lactobacillus plantarum*,

Lactobacillus casei, and *Lactobacillus delbrueckii* subspecies *bulgaricus*), three strains of *Bifidobacterium* (*Bifidobacterium breve*, *Bifidobacterium longum*, and *Bifidobacterium infantis*), and one strain of *Streptococcus* (*Streptococcus salivarius* subspecies *thermophilus*). DSF is the only probiotic which has been shown to potentially be beneficial data in IBD.

DSF has been shown to be effective in inducing and maintaining remission in UC and maintaining remission in pouchitis after ileal pouch anal anastomosis (IPAA).²⁷ In a meta-analysis, DSF had statistically significant higher remission rates in UC (RR=1.74, $p=0.004$) and higher maintenance of remission of remission in pouchitis (RR=0.18, $p<0.00001$).²⁷ In addition, a Cochrane review concludes that DSF may be effective in maintaining remission albeit with lower quality evidence.²⁸ Further data support the use of DSF in induction and maintenance of remission in mild-to-moderate UC when used alongside 5-ASA and immunomodulators.²⁹ However, data on the use of DSF in CD do not support its use.^{53,30}

Although DSF has been associated with vomiting, diarrhea, and abdominal cramping in a minority of patients, it is generally well tolerated.²⁸ It has some evidence to support its use as monotherapy in maintaining remission in pouchitis and as an adjunct to conventional therapy in inducing and maintaining remission in UC.²⁷

Herbal supplements

Andrographis paniculata, also known as creat or green chiretta, is an herb native to India and Sri Lanka. Limited data have found an extract of *A. paniculata* (HMPL-004) to be more effective than placebo in achieving clinical response in mild-to-moderate UC.^{36,37} One study showed that 38% of patients with UC (Mayo 4–10) receiving 1800 mg daily of *A. paniculata* were in clinical remission at 8 weeks compared with 25% of those on placebo; however, this was not statistically significant ($p=0.1011$).³⁶

Indigo Naturalis (IN), also known as Compound Huangdai, is a Chinese herbal medicine. IN in active UC (Mayo score > 5) has been found to have clinical and endoscopic response when compared with placebo; however, its association with

pulmonary arterial hypertension limits its use.³⁸ In a study of 86 patients in Japan, achievement of an endoscopic Mayo score ≤ 1 at week 8 was found in 60% of patients on 1 g IN compared with 13.6% in the placebo group ($p=0.0278$).³⁸ A *post hoc* analysis of these data found benefit in steroid-dependent patients and those who had been exposed to anti-tumor necrosis factor (anti-TNF) agents.³⁹ Another RCT found IN to be effective compared with placebo using the Lichtiger Colitis Activity Index and without any incidents of pulmonary arterial hypertension.⁴⁰

Wheat grass (*Triticum aestivum*) has been found in a small RCT of 23 patients with active distal UC to have improved clinical disease activity indices in UC after 1 month ($p=0.031$).⁴¹ Its use, however, can be limited by nausea in many patients.

Aloe vera has been shown to reduce intestinal inflammation in murine studies.^{42–44} A small RCT of 44 patients found 47% to have a clinical response after 4 weeks of aloe vera gel supplemental use compared with 14% on placebo in mild-to-moderate UC, defined as Simple Clinical Colitis Activity Index (SCCAI) ≥ 3 .⁴⁵ However, no significant difference was found in sigmoidoscopic improvement ($p=0.65$).

Boswellia serrata was found to have similar rates of remission when compared with sulfasalazine in patients with grade II–III (grade II: mucosa becomes irregular and gives way to coarse granularity and becomes dry, hyperemic, and friable. The mucosa displays bleeding from many small sites because of erosions; grade III: areas of ulcerations with mucous and blood as well as pseudopolyps are seen) UC and chronic colitis in nonrandomized studies.^{46,47} In one RCT assessing maintenance of remission in patients with CD (CDAI < 150), no difference was found compared with placebo at week 52.⁴⁸ Overall, 60% of patients in the treatment arm and 55% of patients in the placebo arm stayed in remission ($p=0.85$).

Wormwood (*Artemisia absinthium*) has been shown to reduce corticosteroid requirements in a study of 40 patients with CD (CDAI > 170) when used as a supplementary therapy for 10 weeks.⁴⁹ CDAI scores when compared with placebo in another small study by the same group ($n=20$) found improved CDAI from 275 to 175 in the treatment arm ($p=0.05$).

The data in support of herbal supplements in IBD are limited, and it remains difficult to recommend herbal supplementation in either UC or CD though the data for curcumin in UC are exciting.

Fish oil

The main ingredients in fish oil include omega-3 polyunsaturated fatty acids (n-3 PUFAs), eicosapentaenoic acid (EPA), and docosahexaenoic acid.⁵⁴ Fish oil, as an adjunct to conventional therapy given for 12 months, has been found to improve clinical scores in UC when compared with placebo ($p < 0.05$), however, has not shown improved endoscopic or histologic scores.³¹ Fish oil compared with placebo has been shown to be effective in maintaining clinical remission in CD (CDAI < 150) in a study of 78 patients.³² After 1 year, 23 patients (59%) in the fish-oil group were in remission compared with 10 in the placebo group (26%, $p=0.003$). However, the largest studies looking at n-3 PUFAs (EPIC-1 and EPIC-2) found no difference in prevention of relapse in CD when compared with placebo.³³

The use of essential fatty acids (EFAs) in UC has found no differences in relapse or remission when compared with placebo.³¹ EPA, however, was found in one study to reduce fecal calprotectin (FC) by 100 points or more in 63.3% compared with 13.3% in the placebo arm after 6 months in patients with UC with partial Mayo < 2 ($p < 0.001$).³⁴ In addition, there is some evidence to support decreased corticosteroid requirements in mild-to-moderate (based on a disease activity index) UC patients on fish oil supplementation.³⁴ However, this may be confounded by the fact that patients in the treatment arm were receiving a supplement that included not only fish oil but also fructooligosaccharides, gum arabic, vitamin E, vitamin C, and selenium as well.

Fish oil supplementation may result in halitosis, belching, and diarrhea most commonly.³⁵ However, despite a relatively limited and favorable side effect profile, it is difficult to recommend fish oil for either CD or UC.

Diets and IBD

In this section, we will review commonly used diets by patients with IBD (Table 2). We have not included the use of exclusive enteral nutrition

Table 2. Diets in IBD.

Diet	Composition	Recommended for IBD
Specific carbohydrate diet	Eliminates grains, sugars, and dairy. Allows meat, vegetables, and fruits	Not recommended, insufficient evidence to support use
CD exclusion diet	Eliminates dairy, wheat, animal fats, and all processed foods. Restricted to phases and includes the use of partial enteral nutrition	Not recommended, insufficient evidence to support use
Low FODMAP diet	Eliminates foods high in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols. Eliminates foods high in glucose, fructose, lactose, and artificial sweeteners.	Not recommended, can be trialed in overlap with IBS
Mediterranean diet	Includes a diet rich in fish, nuts, seeds, legumes, and fruits and vegetables.	Yes, easy-to-follow general diet, can be trialed in CD. Caution in patients with stricturing phenotype
Gluten-free diet	Eliminates wheat, rye, barley, and any foods containing gluten peptides.	Not recommended unless concomitant celiac disease

CD: Crohn's disease; FODMAP: fermentable oligo-,di- and monosaccharides and polyols; IBD, inflammatory bowel disease; IBS: irritable bowel syndrome.

(EEN) because we do not consider this an ‘ordinary’ foods-based diet that would fall under the category of complementary or alternative. This formula-based diet, commonly used in pediatric IBD, has an extensive literature and is often used under the guidance of a gastroenterologist and dietician. In fact, the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition recommend EEN as treatment for induction of remission in pediatric CD.⁵⁵

The specific carbohydrate diet

The specific carbohydrate diet (SCD), which centers on the elimination of di- and polysaccharide carbohydrates, entered popular use with the publication of the book *Breaking the Vicious Cycle: Intestinal Health Through Diet* by Elaine Gottschall in the early 1990s.⁵⁶ The diet allows for monosaccharide carbohydrates such as glucose and fructose, thus including most fruits and vegetables. The SCD eliminates grains, such as corn, rice, and wheat, highly processed foods (eliminating additives), and dairy. Unprocessed meats and eggs are allowed, as are nuts, but most legumes are restricted. Rigorous evaluation of this diet in randomized settings is limited. Several small prospective studies have evaluated the SCD in pediatric CD. In one study of 16 children with active CD [pediatric CDAI (PCDAI) ≥ 15], the SCD

demonstrated a significant reduction in PCDAI and Harvey–Bradshaw Index (HBI) over a 12-week induction period, with seven patients showing continued improvements after 52 weeks.⁵⁷ A small retrospective cohort evaluated the effect of the SCD on mucosal healing in CD by SES-CD. This study failed to show significant improvements after a mean of 26 weeks, but was limited by the small sample size of seven patients.⁵⁸ An RCT comparing variations of elimination diets including the SCD, modified SCD, and a whole foods diet showed all patients (10/18) completing the 12-week trial period in clinical remission by PCDAI with a trend in reducing CRP and noted microbiome alterations.⁵⁹

Mediterranean diet

Several studies show improved outcomes among patients with CD who consume a Mediterranean diet (MD). The MD consists of eating a diet that is high in fruits and vegetables, fish, poultry, beans, and liberal use of olive oil. The MD is centered on eating healthy whole foods with a reduction in processed foods, refined grains, and red meat intake. There is some data to suggest an MD may help to prevent CD. A prospective cohort study in Sweden demonstrated a lower risk of CD, but not UC, after a mean follow-up of 17 years when comparing groups highly adherent

to a MD *versus* those not-adherent [Hazard ratio (HR) = 0.42; 95% CI: 0.22–0.80].⁶⁰ Additional data point to higher quality of life scores and a higher likelihood of inactive disease in CD patients adherent to an MD.⁶¹

Recently, the Diet to INducE Remission in Crohn's disease (DINE-CD) trial compared the efficacy of the SCD *versus* the MD in adult patients with CD. The goal of this study was to compare the two diets regarding clinical remission and reduction in markers of inflammation. The primary outcome, clinical remission by CDAI < 150, was the same between both diets (SCD 46.5% *versus* MD 43.5%, $p=0.77$).⁶² Importantly, the change in CRP and FC measurements was not significantly different between the groups. Patients with elevated FC at baseline who achieved a response (FC < 250 $\mu\text{g/g}$ and 50% reduction from baseline) did not significantly differ between groups (SCD 34.8% *versus* MD 30.8%, $p=0.83$). Overall, this study demonstrated that a less restrictive diet like the MD is not inferior to the more rigorous SCD. In addition, we again see that clinical response and biochemical response are not well correlated, and without a placebo control, it is difficult to know what the absolute response rate may be owing to potentially high placebo response rates between the intervention groups. It should be noted that the fiber content of the diet in both arms was increased mainly through increased consumption of fresh fruits and vegetables. This result confirms that many patients with mild–moderate CD can eat fiber safely and likely will benefit, as opposed to following a likely unhealthy low-fiber diet which many have recommended in the past.⁶²

Crohn's disease exclusion diet

The Crohn's disease exclusion diet (CDED) and Crohn's disease treatment with eating diet (CD-TREAT) are real foods-based diets that are limited to induction and maintenance stages and often combined with partial enteral nutrition (PEN) to meet the daily caloric and micronutrient needs in CD. These diets are based on the premise that real foods-based diets can replicate the same anti-inflammatory properties of EEN by restricting certain food groups and allowing others. These diets generally eliminate all processed foods and dairy, while restricting many grains, such as wheat early in the induction phases. A small study of 44 adults with mild-to-moderate

CD (defined as a HBI score of 5–14) compared the CDED alone with CDED plus PEN. At the end of a 6-week induction phase, the diets showed similar efficacy with 68% CDED + PEN and 57% CDED alone in terms of clinical remission (HBI < 5) ($p=0.46$).⁶³ Of those who achieved remission by week 6, 80% remained in remission to week 24 with 35% showing endoscopic remission. Another trial compared CDED with PEN with exclusive EEN alone. The primary outcome here was tolerance of diet, the combination of real foods with supplemental PEN was better tolerated than EEN alone (97.5% *versus* 73.6%, $p=0.002$). Sustained remission at week 12 was greater in the CDED + PEN group compared with EEN alone (76% *versus* 45%, $p=0.01$) with associated lower levels of CRP.⁶⁴ These studies highlight the need to find a diet that can work and EEN but are not limited by palatability and the patient's ability to consume the diet over time without abandoning it.

Low FODMAP diet

A diet low in fermentable oligo-, di- and monosaccharides as well as polyols (FODMAP) has a role in symptom control in irritable bowel syndrome (IBS),⁶⁵ but little is known of its efficacy in IBD. There is little data regarding the low FODMAP effects on inflammation, and the available data tend to evaluate symptom control in quiescent IBD.⁶⁶ A recent meta-analysis of nine studies showed improvements in clinical scores of functional gastrointestinal symptoms, but no significant impact on Bristol stool form scale Mayo score or FC.⁶⁷ A systematic review of four RCT found significant heterogeneity among trials and could not conclude a significant difference in either functional symptoms or markers of inflammation including FC.⁶⁸ A smaller trial suggests a possible role in ameliorating both symptoms and markers of inflammation.⁶⁹ Still, the low FODMAP has limited evidence to support its use for symptom control in patients with IBD.

Gluten-free diet

Gluten, the protein found in wheat, rye, and barley has been implicated in the pathogenesis of inflammatory conditions in patients with celiac disease. The role of eliminating gluten from the diet in patients with IBD is unclear and no randomized trials exist. Many patients with IBD intentionally eliminate gluten-free diet (GFD) to

see if it helps symptoms,⁷⁰ this was highlighted by a questionnaire-based study of Crohn's and Colitis Foundation of America members. In this cross-sectional study of 1647 patients, nearly 20% have eliminated gluten from their diet with 60% of those reporting symptom improvement including less abdominal pain, bloating, and diarrhea with 38% reporting fewer IBD flares. In another study of the Swiss IBD cohort, 5% of patients with IBD reported using a GFD. There was no objective improvement in disease activity or surgery rates. Interestingly, patient on a GFD reported higher levels of anxiety and depression.⁷¹ Currently, there is insufficient high-quality evidence to recommend a GFD for IBD patients in the absence of concomitant celiac disease.

Conclusion

Complementary and dietary therapies for IBD are diverse in both their nature and effect. Unfortunately, there is not enough rigorous data to support the use of these therapies as an alternative to conventional anti-inflammatory and biologic therapy in patients with active IBD. We continue to emphasize the complementary nature of these interventions to our patients, but partner with them to make the right decisions for their disease-specific needs. We cannot definitively recommend the routine use of any herbal or dietary therapies at this time, but there is some quality data to point toward an adjunctive role of turmeric and certainly the MD being a nonrestrictive and healthful approach to eating can be considered.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Author contributions

Hadi J Minhas: Conceptualization; Writing – original draft; Writing – review & editing.

Konstantinos Papamichael: Conceptualization; Writing – review & editing.

Adam S. Cheifetz: Conceptualization; Writing – review & editing.

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