

Complementary, Integrative, and Holistic Medicine: Integrative Approaches to Pediatric Irritable Bowel Syndrome

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INTRODUCTION

Irritable bowel syndrome (IBS) occurs commonly in pediatrics, with the prevalence estimated at 6% to 14%. (1)(2) The Rome criteria define pediatric IBS as abdominal pain that improves with defecation and/or onset associated with a change in frequency or form of stool. (3) In addition, no evidence of an inflammatory, anatomic, metabolic, or neoplastic process explains the symptoms. The cause of IBS is attributed to a combination of factors, including an altered gut microbiome, low-grade mucosal inflammation, visceral hypersensitivity, abnormal motility, psychosocial stressors, and genetic predisposition. (4) Recognition of these factors serves as the foundation for the biopsychosocial approach to treating pediatric IBS.

A successful treatment plan starts with a strong patient-parent-physician relationship in which the child's pain is validated and the physician compassionately approaches the distress that IBS can cause. Multiple studies have shown that children with IBS have a lower quality of life (QOL) that is comparable to that seen with nonfunctional gastrointestinal conditions. (2) (5) Conventional treatment includes education and reassurance, cognitive behavioral therapy (CBT) for some patients, and consideration of antispasmodic or antidepressant medications. In practice, the lack of strong evidence, potential for adverse effects, and parental concern limit the utility of conventional pharmacologic options.

Complementary and alternative medicine (CAM) use in pediatric gastroenterology is common and higher in patients with IBS than nonfunctional gastrointestinal conditions. (6) This article reviews the evidence for CAM therapy in IBS based on adult and pediatric data available in the English language.

PROBIOTICS

The World Health Organization defines probiotics as "live micro-organisms which, when administered in adequate amounts, confer a health benefit on the host." Probiotics adhere to the intestinal epithelium and produce antibiotic substances that alter the cytokine profile to an anti-inflammatory state as well as short-chain fatty acids from poorly digested carbohydrates that affect gut motility. (7) A recent systematic review found the number needed to treat (NNT) to improve IBS symptoms with probiotics was 7. (8)

AUTHOR DISCLOSURE Dr Leiby has disclosed that she is on the Speaker's Bureau for Nestle Infant Nutrition. Dr Vazirani has disclosed no financial relationships relevant to this article. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

“VSL#3” is a multistrain probiotic preparation studied in IBS and inflammatory bowel disease that contains *Bifidobacterium breve*, *B longum*, *B infantis*, *Lactobacillus paracasei*, *L bulgaricus*, and *Streptococcus thermophilus*. This preparation, as well as the strains *B infantis* and *L rhamnosus GG*, have the strongest data to support their use in both adult and pediatric IBS (Table 1)

Probiotic use is based on the concept that the pathophysiology of IBS involves an altered microflora, (9) although current study data are limited by the heterogeneity of the strains and their dosing, which future research may clarify. Despite these limitations, probiotic use for IBS is considered a safe and well tolerated treatment option, based on Grade B evidence.

DIET

More than 90% of adolescents with IBS report that their symptoms are triggered by ingestion of certain foods, with common culprits being large meals, fatty foods, and dairy products. (10) Parents often report that their child’s symptoms are food-related, and a recent study demonstrated that food-related IBS symptoms were associated with lower QOL as compared to patients who had IBS without food-related symptoms. (11)

Fiber consists of unabsorbed carbohydrates that increase fecal water content and bulk. Fiber is fermented to varying degrees in the colon, thus influencing the microbiome. The differences in fermentation and solubility alter laxation and gas production, with the potential adverse effects of bloating and flatus. (12) Early studies of fiber for IBS treatment suggested that although bowel frequency may have improved, pain did not. (13)(14)(15) However, a recent meta-analysis that included 14 randomized, controlled trials showed that soluble fiber, such as psyllium or wheat dextrin, had benefit for

global improvement of IBS (NNT = 7) but bran did not. (16) Starting with a low dose of soluble fiber and titrating up while watching for increased gas may be helpful.

Adverse reactions to food proteins can represent a food allergy, with a specific immune response, rather than food intolerances/sensitivities, which cause symptoms but do not have an established immunologic mechanism. (17) A recent study showed a greater number of children reporting recurrent abdominal pain as a symptom of food intolerance (20%) compared with those who had a true allergy (2.3%). (18) Understanding the mechanism of food intolerance presents many challenges. Multiple macronutrients in one food may produce symptoms, such as the carbohydrate (lactose), protein (casein and whey), and fat in dairy products and gluten protein versus wheat starch in bread. A few studies have suggested that gluten may be a cause of IBS symptoms in patients without celiac disease. (19)(20) However, a more recent study did not show a gluten effect after reduction of fermentable short-chain carbohydrates, suggesting that IBS symptoms may be due to the poorly absorbed starches in wheat. (21)

Recently, high-quality evidence has emerged suggesting that a low-FODMAPs (fermentable oligosaccharides [fructans, such as in wheat], disaccharides [lactose], monosaccharides [fructose] and polyols [sugar alcohols: sorbitol]) diet reduced IBS symptoms in adults. (22) FODMAPs are poorly absorbed, fermentable short-chain carbohydrates that act as substrates for bacterial metabolism that produces gas, leading to colonic distention and resulting in bloating and pain. Results of the first double-blind, randomized trial in pediatrics are encouraging. (23) A total of 45 children with IBS were randomized to a high-FODMAP (50 g/day) versus low-FODMAP (9 g/day) diet. (23) Thirty-three patients completed the crossover design and reported significant improvement in bloating, nausea, and abdominal pain

TABLE 1. Probiotics Studied for Irritable Bowel Syndrome

PROBIOTIC	DOSE AND ADMINISTRATION	STUDY DESIGN	RESULTS
VSL#3 ⁴³	450-900 × 10 ⁸ CFU vs placebo × 6 wk	Randomized, double-blind, placebo-controlled (pediatric)	Improved global assessment of relief (P < .05)
<i>Bifidobacterium infantis</i> ⁴⁴	1 × 10 ⁸ CFU once daily vs placebo × 4 wk	Randomized, double-blind, placebo-controlled (adult)	Reduced abdominal pain (P < .03)
<i>Lactobacillus rhamnosus GG</i> ⁴⁵	3 × 10 ⁹ – 1 × 10 ¹⁰ CFU twice daily vs placebo for 4-8 wk	Meta-analysis (pediatric)	Relative risk 1.7, 95% confidence interval 1.27-2.27, number needed to treat 4, 95% confidence interval 3-8

CFU=colony-forming units.

($P < .01$). The low-FODMAP diet eliminates certain fruits and vegetables, wheat, high-fructose corn syrup, legumes, and any lactose-containing dairy products. A strategy to allow the least restrictive diet may involve initial strict elimination of high-FODMAP foods with gradual re-challenge to determine the level of intake that maintains symptom control.

Food-specific immunoglobulin G (IgG) antibodies are physiologically produced in response to food exposure. However, one randomized, controlled trial (24) and two smaller nonrandomized trials (25)(26) showed some evidence of symptom reduction using IgG-specific elimination diets in adult patients with IBS. These data are preliminary, and further research is needed before recommending clinical use of IgG testing in pediatrics.

Dairy and higher-fat foods are common symptom triggers for IBS. Affected patients are more sensitive to the effects of lactase deficiency that lead to symptoms of lactose intolerance, such as bloating, increased flatus, and diarrhea. (27) Intestinal sensitivity is increased by lipids in the small bowel, causing discomfort for patients who are viscerally hypersensitive at baseline. (28) The normal changes in motility triggered by lipids (delayed gastric emptying, delayed small bowel transit, and accelerated colonic transit) also are heightened in those who have IBS.

When foods are convincingly linked with a patient's symptoms and the family can manage the complexities of the diet while providing adequate nutrition, it is reasonable to limit offending foods. However, clinicians and families must consider the psychosocial challenges of strict elimination diets and the risk of nutritional deficiencies. Therefore, collaboration with a registered dietitian may help to maintain a balanced diet. Further, although dietary restrictions may benefit some patients, entirely skipping meals has been shown to worsen IBS symptoms. Based on Grade B evidence, reintroduction of the "offending" foods may be considered to assess true

response to dietary elimination and assist in avoiding overly restrictive diets.

HERBS/BOTANICALS

A variety of herbs have been studied for IBS, including turmeric, peppermint, and artichoke leaf extract, with some suggestion of benefit. Iberogast, a combination of 9 herbs (chamomile flowers, bitter candytuft, angelica root, caraway fruits, milk thistle, lemon balm leaves, greater celandine, licorice root, and peppermint leaves) has been used for more than 30 years in Germany for functional dyspepsia. Recently it has been studied for use in IBS, with positive preliminary results. The lack of supplement ingredient regulation and few studies in this area limit the ability to make recommendations for pediatric IBS (Table 2).

BIOBEHAVIORAL

Cognitive Behavioral Therapy

A number of biobehavioral options have been evaluated to manage IBS, including yoga, hypnotherapy, and CBT. CBT aims to identify symptom triggers and help patients develop coping skills. This is a commonly accepted therapy for IBS, with the American Academy of Pediatrics concluding that short-term use may improve pain and disability (29) and the American College of Gastroenterology (ACG) meta-analysis concurring that it is an effective therapy for IBS with a NNT of 3 to 4. (30) Evidence is rated as Grade A.

Yoga

Yoga has been studied in children for cardiorespiratory fitness, mental health conditions, and IBS. (31) In 2006, 25 adolescents with IBS were randomized to a yoga intervention that consisted of 1 live class and 4 weeks of a home instructional video. The yoga group had lower levels of

TABLE 2. Herbs and Botanicals Studied for Irritable Bowel Syndrome (IBS)

HERB	DOSE AND ADMINISTRATION	STUDY DESIGN	RESULTS
Turmeric ⁴⁶	73 mg vs 144 mg standardized extract tablets × 8 wk	Partially blinded, randomized, two-dose, pilot study (adult)	Decreased IBS prevalence ($P < .001$), trend to reduced pain ($P = .071$)
Peppermint ⁴⁷	187 mg (<45 kg) or 374 mg (≥45 kg) vs placebo capsules thrice daily × 2 wk	Randomized, double-blind, placebo-controlled (pediatric)	Decreased severity of pain ($P < .03$)
Iberogast ⁴⁸	Liquid extract 20 drops thrice daily vs placebo × 4 wks	Multicenter randomized, double-blind, placebo-controlled (adult)	Decreased abdominal pain ($P = .0009$)
Artichoke leaf extract ⁴⁹	320 mg or 640 mg standardized extract once daily × 8 wk	Postmarketing surveillance in IBS with concomitant dyspepsia (adult)	Reduction in dyspepsia ($P < .001$), normalization of bowel pattern ($P < .001$)

functional disability and anxiety ($P < .10$) but no change in overall gastrointestinal symptoms. (32) A pilot study in the Netherlands of 20 children ages 8 to 18 years showed a significant decrease in pain frequency and intensity after 10 sessions of yoga. (33) A recent study of adolescents and young adults practicing a yoga protocol for 3 hours per week over 6 weeks demonstrated lower physical disability in the adolescents and decreased IBS symptoms and psychological distress in the young adults. (34) The overall evidence for yoga efficacy in IBS is rated as Grade B.

Hypnotherapy

Hypnotherapy (HT) has been used for pain control in medicine since the 19th century and studied for IBS since 1984, with Grade B evidence suggesting that it decreases stress and somatization. (35) Brain imaging has demonstrated that HT reduced activity in the anterior cingulate cortex, a region shown to be overreactive in adults with IBS. (36) The 2014 ACG systematic review and meta-analysis of psychological therapies for IBS pooled data from 5 adult randomized, controlled trials and found substantial benefit for HT over control therapy with an NNT of 4. (30) Vliegar et al randomized 53 patients ages 8 to 18 years to either standard treatment (education and supportive therapy) or 6 HT sessions consisting of relaxation and suggestions to control abdominal pain, gut function, and ego strengthening. (37) At both 1 year ($P < .001$) and 5 years ($P = .005$), results with HT were superior to those with standard therapy. (38) Results of 2 other studies of children with functional abdominal pain favored the use of HT for reduction of pain and absenteeism. (39)(40) It is reasonable to include these 2 studies in this review because pediatric functional abdominal pain and IBS are similar in presentation and response to psychological therapies. (41) Although sample sizes are small, the available literature indicates that HT is more effective than usual treatment in children. Limitations include whether results are generalizable to hypnotherapists outside of a research setting and the availability/insurance coverage of hypnotherapists. An ongoing pediatric study comparing HT via a CD audio recording listened to in the home with individual therapy should address some of these issues. (42)

CONCLUSION

Once a diagnosis of IBS is established, a suggested approach is to help the family understand that coping strategies are important for symptom management because psychological and environmental factors play a role in the disease. Validation and reassurance may be sufficient treatment

for many children and families, but psychological, pharmacologic, or dietary treatment may also be needed for some. Strong evidence supports the efficacy of CBT, and emerging data suggest that clinical HT and yoga also may be beneficial. Probiotics and certain herbs may be useful adjuncts to biobehavioral therapy. Above all, acknowledging that the patient's symptoms are genuine is most important for strengthening the patient-parent-physician bond, assuring the patient of the physician's belief in the patient's pathology, and initiating discussions about the "brain – gut" connection.

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Parent Resources from the AAP at HealthyChildren.org

- English only: <https://www.healthychildren.org/English/health-issues/conditions/abdominal/Pages/Irritable-Bowel-Syndrome-IBS-and-Inflammatory-Bowel-Disease-IBD.aspx>

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