ADVANCES IN IBD

Current Developments in the Treatment of Inflammatory Bowel Disease

Section Editor: Stephen B. Hanauer, MD

Mitigating the Adverse Effects of Poor Nutritional Status in the Management of Adult Patients With Crohn's Disease

Stephen A. McClave, MD
Professor of Medicine
Director of Clinical Nutrition
University of Louisville School of Medicine
Louisville, Kentucky

G&H How much impact do poor nutritional status and inadequate nutrition therapy have on adult patients with Crohn's disease?

SM Malnutrition has an adverse effect on any patient. It is usually defined by reduced volitional intake, weight loss over a specified period of time, or a body mass index (BMI) of less than 18.5. It occurs over a wide range (20%-70%) of all patients with inflammatory bowel disease (IBD), representing a greater than 5-fold increase in incidence compared with patients without IBD. The risk of malnutrition is greater in Crohn's disease compared with ulcerative colitis, active disease rather than quiescent disease, and inpatients compared with outpatients. The risk is increased slightly in patients with an ileostomy or jejunostomy, or in those placed on a restrictive diet. Unfortunately, malnutrition has a tremendous impact on disease activity and patient management. Malnutrition increases the likelihood of flares, reduces response to biologic agents, increases infection risk and hospital length of stay, raises costs, adversely affects quality of life, and prolongs duration of recovery.

G&H Does a BMI above normal with recent weight stability confirm adequate nutritional status?

SM Unfortunately, a normal or above normal BMI with recent weight stability can be misleading or hide complications from long-standing problems with poor nutritional status. Patients should be screened for 4 additional clinical conditions, which can have tremendous impact on Crohn's disease management. First, sarcopenia represents the loss of muscle mass to below a normal range, as diagnosed by computed tomography scan or dual-energy X-ray absorptiometry scan. Sarcopenia is linked to increased need for biologic therapy, loss of response for those patients already on biologic therapy, increased need for surgery, and greater frequency of postoperative complications. Second, frailty represents muscle weakness, diagnosed by functional evaluations such as handgrip dynamometry, sit-to-stand test, or 6-minute walk test. Frailty can cause increased infectious morbidity, higher mortality, and a 4-fold greater need for hospital admission in patients with Crohn's disease. Third, micronutrient deficiencies, specifically those related to zinc, vitamin A, vitamin K, folate, and vitamin B12, can increase proinflammatory T-helper 17 cells and reduce T-regulatory cells, which have the overall effect of increasing oxidative stress and proinflammatory signaling. Fourth, an eating disorder referred to as avoidant/restrictive food intake disorder (ARFID), in which patients progressively reduce the variety of food ingested, occurs in approximately 17% of patients who have Crohn's disease. Its occurrence is associated with a 4-fold increase in the risk of malnutrition. The risk occurs particularly in those who are already picky eaters, have a low appetite, have a fear of eating, or are placed on a restrictive diet. ARFID is diagnosed by a 9-item screening examination.

G&H Does a typical Western diet pose added risk for adult patients who have Crohn's disease?

SM A typical Western diet is ingested by the majority of patients in the United States. A pooled cohort study

published in 2023 by Narula and colleagues showed that highest to lowest ingestion of a Western diet was associated with a 70% increase in risk of developing Crohn's disease (hazard ratio, 1.7). The typical Western diet has a potentially adverse macronutrient profile because the carbohydrates tend to be low in fiber (and subsequently short-chain fatty acids), the fat is in the form of saturated fat with less polyunsaturated fat, and the protein tends to be animal-based rather than plant-based. All of these factors in the macronutrient profile contribute to gut barrier dysfunction and mucosal immune perturbations. Specific components in a Western diet contribute further to its adverse effect. Maltodextrin, a starch that is added to thicken foods or act as a sweetener, increases bacterial biofilms in IBD. Emulsifiers such as lecithin, carrageenan, and polysorbate 80 are added to increase texture and the quality of food. These emulsifiers decrease the mucus layer in the intestinal mucosa and subsequently increase the number of colitis lesions found on endoscopy. Preservatives such as sulfites, nanoparticles, and titanium oxide, which are contained in wine, processed meat, and canned foods, increase the risk of pathogens and stimulate the inflammasome in the intestinal mucosa. For these reasons, Dr Stephanie Gold, an IBD physician nutritionist at Mount Sinai in New York tells her patients to "prioritize whole foods, not fast foods."

In adults, EEN can be used as adjunctive therapy for induction of Crohn's disease and maintenance in low-risk patients, as recommended by the American College of Gastroenterology.

G&H Are specialized restrictive diets more appropriate in this patient population?

SM A number of studies in the past have supported the use of specialized restrictive diets to help induce remission for patients with Crohn's disease, such as the Crohn's Disease Exclusion Diet, the Specific Carbohydrate Diet, the Anti-Inflammatory Diet, or the CD-TREAT Diet. The main challenge with these diets is that they are difficult to implement. The patient education required for these diets is complex and poorly assimilated, impact on the health care staff is significant, compliance long term is poor, and their use may contribute to the risk of developing ARFID. The popularity of these restrictive diets diminished dramatically 5 years ago with the publication of the DINE-CD study by Lewis and colleagues, which compared the Specific Carbohydrate Diet with the Mediterranean diet and showed no difference in the likelihood of inducing remission in Crohn's disease. The Mediterranean diet has subsequently emerged as the default diet. It is more plant-based with fruits and vegetables and less animal-based, restricting the use of fish, poultry, dairy, and especially red meat. The Mediterranean diet avoids processed food, promotes whole grains, and recommends the use of olive oil as the principal fat, particularly when cooking.

G&H Does exclusive enteral nutrition have a role in managing adult Crohn's disease patients?

SM Exclusive enteral nutrition (EEN) is a strategy where the patient consumes no solid food and is provided only enteral formulas orally or through a feeding tube. Initially, with more data originating in Asia than Western countries, study results implied that the formulas had to be elemental or semi-elemental in design. More recent trials have shown that standard polymeric formulas are equally as effective. This strategy has been more successful as first-line therapy for induction of remission of Crohn's disease in pediatric patients, as recommended by the European Society for Clinical Nutrition and Metabolism and the North American Society for Pediatric Gastroenterology, Hepatology & Nutrition. Parental compliance in placing nasogastric tubes nightly and providing formula to their children is high, as pediatricians promote the strategy as having little or no side effects. However, when talking with adult patients who underwent this strategy as children, many say it was somewhat traumatic. In adults, EEN can be used as adjunctive therapy for induction of Crohn's disease and maintenance in low-risk patients, as recommended by the American College of Gastroenterology. The mechanism by which EEN induces remission is thought to be related to intestinal monotony, reduced distension of the bowel, and less antigen stimulation from the components of the Western diet. Challenges with its implementation include taste fatigue, poor palatability, and noncompliance.

Partial enteral nutrition (PEN) is a strategy where 20% to 60% of a patient's daily calories are provided as a formula, the rest being consumed by 1 or more meals. While this strategy has been shown to reduce symptoms and decrease calprotectin, PEN does not improve lesions

found at the time of endoscopy. PEN is slightly less effective than EEN, but both of these strategies can serve as a bridge, either from corticosteroids to biologic agents or from induction therapy to maintenance therapy.

It is important to note that total parenteral nutrition (PN) is not required to induce remission or control symptoms, owing to the wide variety of strategies now available through enteral nutrition and the fact that any clinical improvement achieved with PN is readily reversed with reintroduction of enteral nutrients. In the absence of severe short bowel syndrome, PN has assumed much more restricted use in these complex patients.

G&H Should fiber be avoided in this patient population?

SM Fiber has tremendous value for the patient with Crohn's disease because of the fermentation of soluble fiber to short-chain fatty acids (especially butyrate), which support gut barrier defenses and have both local and systemic anti-inflammatory effects. Dr Gold recommends that adult patients with Crohn's disease avoid fiber restriction by using texture modification instead. She beautifully describes 3 categories of patients, ranging from those with the greatest disease severity who need the most texture modification, to a moderate group, and finally to a group of patients with little disease severity who are doing well and should be able to tolerate raw fruits and vegetables with little or no texture modification. In the severe group, those patients with an ileostomy or jejunostomy, history of small bowel obstruction, active IBD, or Crohn's stricture should have the softest texture, and fruits and vegetables should be provided either in the form of a smoothie or as a puree. The moderate category includes those patients with mild to moderate disease activity and less symptomatology, for whom food is being reintroduced. Here, soft textures can be achieved if the fruits and vegetables are cooked and/or peeled. In the group of patients with little disease activity who are doing well or are in remission, have no ileostomy or stricture, or history of small bowel obstruction, harder textures are well tolerated, and fruits and vegetables can be provided in the raw form. For example, blueberries could be consumed as a smoothie in the severe category, as a blueberry muffin in the moderate category, or as raw fruit in the group with the lowest disease severity.

Instead of probiotics, patients can prioritize probiotic foods (such as yogurt or kefir) or include fruits and vegetables in their diet, modifying the texture as previously described.

G&H Should supplements be provided to adult patients who have Crohn's disease?

SM Surprisingly, few supplements may be required in the management of patients with Crohn's disease. Certainly, adequate hydration can be achieved with the help of oral rehydration solutions. Oral nutrition supplements with formula, given with or between meals, may be needed for unintentional weight loss. These products can be provided in dairy, nondairy, lactose-free, or kosher formulations. It is important to supplement and correct specific micronutrient deficiencies. Multivitamins should be provided in a chewable form to promote better absorption. Unnecessary supplements should be avoided, such as coenzyme Q10, collagen, cod liver oil, resveratrol, hemp oil, and ashwagandha, any of which can increase cost, lead to side effects, and contribute to polypharmacy.

G&H Do probiotics have a role in the management of these patients?

SM The data on probiotics in IBD are variable and not strong enough to support their routine use. There are no recommendations from societal guidelines promoting their use in IBD. Early studies that suggested clinical value from the use of probiotics in pouchitis could not be validated in later trials. Instead of probiotics, patients can prioritize probiotic foods (such as yogurt or kefir) or include fruits and vegetables in their diet, modifying the texture as previously described.

G&H How would you summarize the current approach to the nutritional management of adult patients with Crohn's disease?

SM Leading IBD nutritionists such as Dr Gold and Dr Berkeley Limketkai at UCLA have helped streamline our overall approach to the nutritional management of these patients. All patients should be screened for malnutrition, sarcopenia, frailty, ARFID, and micronutrient deficiencies. Patients should avoid fast foods or highly processed foods, which characterize the Western diet, and use instead the Mediterranean diet as the default solid food

regimen. There is little need for restrictive diets in today's management. The patient's diet should include a source of fiber and short-chain fatty acids in the form of fruits and vegetables, modifying texture in the presence of flares, ileostomy/jejunostomy, strictures, history of small bowel obstruction, or active disease. A diet low in fermentable oligosaccharide, disaccharide, monosaccharide, and polyol carbohydrates may help control symptoms. EEN may help induce remission, more successfully in pediatric and adolescent patients than adult patients. PEN combined with the Mediterranean diet may achieve similar results as EEN. Finally, ensuring adequate hydration and appropriate use of supplements is always an important aspect of care.

G&H What further research is needed?

SM There are several categories where additional information would be useful. The Mediterranean diet should be studied formally in comparison with the Western diet. Biologic agents vs biologic agents together with oral nutrition supplements (between meals and at bedtime) should be evaluated. Biologic agents alone should be compared with biologic agents combined with use of PEN. Finally, PEN provided in low dose vs high dose (as a percentage of the daily caloric intake) should be studied to help guide that particular strategy.

Disclosures

Dr McClave has served as an educational consultant to Nestle and Abbott.

Suggested Reading

Bischoff SC, Bager P, Escher J, et al. ESPEN guideline on clinical nutrition in inflammatory bowel disease. *Clin Nutr*. 2023;42(3):352-379.

Gold S, Park S, Katz J, McClave S, Martindale R. The evolving guidelines on fiber intake for patients with inflammatory bowel disease; from exclusion to texture modification. *Curr Gastroenterol Rep*. 2025;27(1):23.

Hashash JG, Elkins J, Lewis JD, Binion DG. AGA clinical practice update on diet and nutritional therapies in patients with inflammatory bowel disease: expert review. *Gastroenterology*. 2024;166(3):521-532.

Haskey N, Gold SL, Raman M. Rethinking nutrition in inflammatory bowel disease: the case for a whole food approach. *Gastroenterology*. 2025;169(7):1344-1345.

Lewis JD, Sandler RS, Brotherton C, et al; DINE-CD Study Group. A randomized trial comparing the specific carbohydrate diet to a Mediterranean diet in adults with Crohn's disease. *Gastroenterology*. 2021;161(3):837-852.e9.

Meyer A, Agrawal M, Savin-Shalom E, et al. Impact of diet on inflammatory bowel disease risk: systematic review, meta-analyses and implications for prevention. *EClinicalMedicine*. 2025;86:103353.

Narula N, Chang NH, Mohammad D, et al. Food processing and risk of inflammatory bowel disease: a systematic review and meta-analysis. *Clin Gastroenterol Hepatol*. 2023;21(10):2483-2495.e1.