Diet and Nutrition in Ulcerative Colitis: 5 Things to Know

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Ulcerative colitis (UC) is one of the two major types of chronic inflammatory bowel diseases (IBD), along with Crohn's disease. UC affects the large bowel, has no known cure, and requires lifelong management with medications and, in some cases, surgery. Patients may experience periods of active disease and quiescence or remission that can be unpredictable. Although medical and surgical therapies are the mainstay of treatment for UC, diet and nutrition are important in the management of UC.

Here are five things to know about the role of diet and nutrition in UC.

1. Nutrition plays an important role in UC management.

Patients with UC are at risk for malnutrition, which negatively affects disease course and outcomes, including reduced response to therapy, increased risk for emergency surgeries, prolonged hospital stays, decreased quality of life, and increased healthcare costs. Common factors that contribute to malnutrition in patients with UC include reduced appetite, food avoidance, diarrhea, impaired intestinal absorption, ongoing protein loss through the stool, and heightened energy needs resulting from hypercatabolism, all of which can lead to unintentional weight loss, micronutrient deficiencies (eg, anemia, vitamin D deficiency), and decreased bone health. Additionally, medical treatments such as corticosteroids and methotrexate or sulfasalazine can cause drug-nutrient interactions that negatively affect bone health and folate levels, respectively. Therefore, the American Gastroenterological Association, European Society for Clinical Nutrition and Metabolism, and the American College of Gastroenterology guideline recommend the following for patients with UC:

- Screening for malnutrition for all patients, at diagnosis and at regular intervals
- Access to a registered dietitian (for all newly diagnosed patients, those with complicated disease, and those with symptoms of malnutrition) with expertise in IBD
- Monitoring micronutrient levels at regular intervals (complete blood count, ferritin, iron saturation, vitamin D)
- Assessing bone mineral density

2. Diet can complement medical and surgical therapy, improving symptoms and clinical outcomes.

Research has shown that 28%-89% of people with IBD have food avoidance and 41%-93% engage in restrictive dietary behaviors. Moreover, a cross-sectional study found that a majority of patients with IBD modify their diet without first seeking guidance from a nutrition expert, increasing the risk for nutrient inadequacies and poor food-related quality of life. While patients may experience clinical improvement with dietary changes, this may not correlate with reduced intestinal inflammation, the latter of which is associated with the best long-term outcomes in

IBD. Although robust studies on the impact of diet on UC are still limited, prospective studies suggest that a Mediterranean diet— which is rich in fiber, plant foods, and omega-3 fatty acids, and low in saturated fat, red and processed meats, and ultraprocessed foods — is associated with better symptom control and reduced markers of inflammation (eg, C-reactive protein, fecal calprotectin). In addition to having benefits for UC, a Mediterranean diet can also help maintain a healthy weight, improve cardiometabolic health, and decrease the risk for cancer.

Patients experiencing a disease exacerbation or sensitivity to whole foods should consider gentle reintroductions of plant foods in pureed, mashed, soft-cooked, or peeled forms before graduating to whole or uncooked forms. Small studies have investigated elimination diets such as the UC exclusion diet (participants were pediatric patients ages 8 -19) and the 4 Strategies to Sulfide-Reduction diet, but larger trials are needed to better understand their impacts on disease activity. A randomized controlled trial by Sahu and colleagues found that exclusive enteral nutrition (an all-formula diet) for 7 days in patients with acute severe UC was associated with significantly reduced composite outcomes for 6-month colectomy and rehospitalization.

In patients who require colorectal surgery, prehabilitation, a multimodal approach to optimizing patients nutritionally, physically, and mentally, has been shown in multiple randomized controlled trials to decrease surgical complications and hospital length of stay. To date, no specific standardized nutrition protocol exists for surgical patients with IBD, but nutrition optimization strategies such as screening for malnutrition and anemia, counseling on perioperative diet needs, encouraging the use of oral nutrition supplements such as standard formulas, immunonutrition, carbohydrate loading, and early advancement of diet after surgery may help to decrease surgical complications.

The most common surgical procedure for patients with UC is a proctocolectomy with ileal pouch-anal anastomosis (J-pouch surgery). Postoperatively, patients may experience an increase in stool frequency or volume. Incorporating soluble and viscous fibers such as potatoes, bananas, applesauce, berries, and oats may help with decreasing stool frequency and volume. Fruits have also been shown to help improve pouch function and may protect against pouchitis. Additionally, the hydration status of patients should be monitored, as dehydration may occur postoperatively, and micronutrients such as iron, vitamin D, and B12 should be routinely assessed due to high prevalence rates of anemia and osteopenia.

3. The microbiome and its metabolites are strongly influenced by diet, most notably fiber-rich foods.

UC is thought to be caused by an interplay between an altered innate immune system, the environment, and the microbiome in genetically susceptible individuals. Dietary interventions have the potential to modify disease course through a variety of mechanisms, including a strong influence on the microbiome and metabolome. Within the protective mucus barrier covering the colonic intestinal epithelium is a microbial environment that is nourished by a fiber-rich diet. Short-chain fatty acids are important anti-inflammatory metabolites generated by microbes in people who consume a fiber-rich diet. They also aid in fluid and electrolyte absorption and serve as the colon's primary fuel source. In patients with inadequate fiber intake, microbes begin to degrade the protective mucus layer of the colon, allowing pathogens to cross the gut barrier and trigger an inflammatory cascade. (Patients with UC experiencing flares are often instructed to follow a low-fiber diet, which has the potential to deprive the intestinal microbiota of healthy substrate, and the colon of anti-inflammatory metabolites.)

A prospective, catered-food study by Fritsch and colleagues of patients with mild UC demonstrated that a high-fiber, low-fat diet improved symptoms and quality of life, reduced inflammatory markers, and improved microbiome characteristics. In addition, Haskey and colleagues found that a Mediterranean diet had beneficial effects on the microbiome in patients with quiescent UC, shifting the gut microbiota to include species associated with protective effects (*Alistipes finegoldii* and *Flavonifractor plautii*) and the production of short-chain fatty acids (*Ruminococcus bromii*).

4. High visceral adiposity is associated with worse outcomes in UC.

Body composition, including the proportion of adipose tissue relative to lean mass, is associated with response to biological therapy. Regarding the proportion of fat mass, visceral adipose tissue (VAT) appears to play an important role in health outcomes in patients with UC and other IBD. A study by Yarur and associates found that patients with IBD and higher levels of intra-abdominal VAT had poorer responses to biologic therapy (infliximab, ustekinumab, and vedolizumab), including lower rates of clinical response and remission. Worse outcomes seen in the high intra-abdominal VAT group may be partly due to a higher inflammatory burden induced by VAT through the secretion of adipokines.

Furthermore, a retrospective study by Sehgal and colleagues found an association between increased visceral adiposity and a shorter interval between flares in patients with UC or Crohn's disease. Reducing visceral fat in patients with UC may not only improve response to therapy but also extend the time between disease flares. Although no data exist on effective strategies for reducing visceral fat in persons with UC, insights from intervention studies suggest that several strategies, including time-restricted eating, a fiber-rich or polyphenol-rich Mediterranean diet, and physical activity, may effectively assist with reductions in visceral fat. The introduction of glucagon-like peptide 1 (GLP-1) receptor agonists also warrants further investigation in IBD patients, as initial study findings suggest that these drugs can influence mechanisms involved in the development of IBD.

5. Controlled UC disease activity and adequate nutrition support a healthy pregnancy and improve fetal outcomes.

Women with UC can have healthy pregnancies, with disease quiescence and good nutrition allowing for best outcomes. A patient's preconception disease activity can help predict disease activity during pregnancy. Studies have shown that pregnant patients with UC, particularly those with active disease and on drug therapy, are at increased risk for preterm and cesarean deliveries. Also, babies born to patients with UC are at increased risk of having low birth weight and being small for gestational age. IBD exacerbations and malnutrition can increase the risk for these complications and infant infections.

There is a close relationship between maternal microbiome transmission and an infant's neurodevelopment and immune system. A recent nationwide cohort study by Guo and colleagues suggests that because the microbiome of the mother is passed on to the baby, optimizing the maternal microbiome through a diverse diet may reduce the offspring's risk of developing IBD. A healthy, balanced diet rich in fruits, vegetables, and lean proteins should be encouraged, with increases in energy in the second and third trimesters to promote healthy weight gain. Micronutrient supplementation with a prenatal multivitamin, iron, vitamin D, folate (in the form of folic acid), and vitamin B12 may be needed to promote maternal and fetal health.