

Our comments, if applied, will provide valid scientific support for a near certain cause of many instances of IBD that require diet changes.

Important Note: Hardly any physicians or researchers understand the dynamics of hyperosmotic substances on cell barriers; e.g. the GI, lung, vascular lining, etc. While the following focuses on community acquired pneumonia and e-cigarettes as a factor, a detailed explanation of hyperosmotics is included.

<https://www.mcfip.net/upload/Community%20Acquired%20Pneumonia%20Issues.pdf>

https://www.medpagetoday.com/reading-room/aga/lower-gi/74949?xid=nl_mpt_DHE_2018-09-07&eun=g407160d0r&pos=1&utm_source=Sailthru&utm_medium=email&utm_campaign=Daily%20Headlines%202018-09-07&utm_term=Daily%20Headlines%20-%20Active%20User%20-%2020180%20days

Dietary Therapies for IBD Get a Closer Look

Nutritional interventions may help avoid surgery in patients with complicated Crohn's disease
Latest In AGA Reading Room

- by Diana Swift
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- This Reading Room is a collaboration between MedPage Today® and:

Expert Critique

FROM THE AGA READING ROOM



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Researchers are beginning to understand that diet may play a key role in triggering inflammation at the onset of inflammatory bowel disease (IBD). Patients with IBD are looking for ways to improve their symptoms and treat their disease without adding medications or possibly being able to cut back on medications. Unfortunately, evidence to support the use of dietary intervention alone to treat IBD is lacking.

A recent review including 14 studies assesses the impact of dietary changes in the treatment of IBD and reports that different foods are able to trigger pro- or anti-inflammatory reactions. Foods that are high in animal fat or protein, dairy fat, wheat products, or foods that contain emulsifiers or thickeners are all associated with triggering intestinal inflammation.

Studies have shown that exclusive enteral nutrition (EEN), which entails a diet where all calories are from liquid nutritional formulas and no solid foods; partial enteral nutrition, which entails a portion of calories from liquid nutritional formulas and a portion are from solid foods; and elimination diets, which require the avoidance of certain foods, may all improve intestinal inflammation in newly diagnosed IBD patients. Further, short-term studies of EEN, consisting of 12 weeks of dietary modification, have shown improvement in inflammatory strictures and enterocutaneous fistulas in patients with Crohn's disease. Unfortunately, these diets are difficult to maintain for long periods of time. A multicenter trial to study the efficacy of two different diets in Crohn's disease is currently underway and will hopefully help to fill the gap in the evidence to support dietary therapy in IBD.

[Full Critique](#)

Increasingly, diet is being appreciated as a non-genetic exposure in the pathogenesis of Crohn's disease (CD) and ulcerative colitis (UC), with dietary factors potentially altering the microbiota, metabolome, host barrier function, and innate immunity. In addition, although trials are few, nutritional interventions are being considered in the management of inflammatory bowel disease (IBD).

"Dietary therapies, and especially exclusive enteral nutrition, or EEN, may be an underutilized and potent tool, whether as a stand-alone therapy or in combination with drugs, to treat Crohn's," Arie Levine, MD, of Tel Aviv University in Israel, and lead author of a recent overview on diet in IBD, told the *Reading Room*. "Furthermore, dietary therapy may be the only therapy directed to the cause of the disease."

Added Jason K. Hou, MD, of Baylor College of Medicine in Houston: "Often our patients are looking for something that can reduce the amount of medication they take or augment the benefits of medication when they don't have a complete response." But solid evidence of efficacy remains elusive. "There are some interesting hypothetical concepts but to date not a tremendous amount of traditional quantitative data to support specific therapies."

In their overview in *Gut*, Levine and colleagues marshaled cell-line, animal, and human studies showing that modern dietary components, both natural and chemical, can impact the intestinal mucosal barrier and affect the immune milieu.

'Yin-Yang Combination'

The team evaluated 14 studies, published from 2009 to 2017, showing a yin-yang combination of both pro- and anti-inflammatory effects triggered by different food items. Among naturally occurring items, sugar, fat, sodium caprate, gluten, wheat, pectin, fermentable fiber, alcohol, and salt were all associated variously with the following immune effects: increased tumor necrosis factor (TNF) α and IFN γ secretion, decreased mucin protein (MUC)2 secretion, as well as modulation of pro-inflammatory cytokines and reduced production of immunoglobulin (Ig)E, IgG, IgM, and CD4+ and CD45+ lymphocyte cell production.

Depending on the component, end effects included a decrease or increase in tight junction proteins, an increase in intestinal permeability, aggravation of ileal inflammation, ion of tight junction proteins, and a reduced disease activity score.

Modern food preservatives, thickeners, and emulsifiers such as polysorbate-80 maltodextrin, and carrageenan almost always had adverse effects: they were linked to depletion of the protective mucus layer, distended and bacteria-filled spaces between the intestinal villi, decreased bacterial richness, enhanced adhesion of *Escherichia coli* and other bacteria to the mucosa, lowered transepithelial resistance, and worsened colitis.

MCFIP - There is a typographical error. Polysorbate-80 and maltodextrin are different products. However, both are hyperosmotic and near certain causes of IBD. The problem intensifies because the most popular sugar substitute, mannitol, is also hyperosmotic. Studies support the likelihood that carrageenan also induces hypersonic stress.

"High animal or dairy fat, animal protein, wheat, emulsifiers, and thickeners appear to top the list of candidate foods associated with intestinal inflammation in animal models," Levine and co-authors wrote.

EEN and PEN, Low-FODMAP Diets

EEN, involving the exclusive use of liquid nutrition in medical formulas without exposure to table foods for 6 to 8 weeks, is a regimen not easy to follow, especially for children. But it has been found to induce remission of pediatric IBD at time of onset. In a study of children with active CD, [Lee et al](#) found that 88% of those on EEN achieved a clinical response with reduced mucosal inflammation versus 84% of those on anti-TNF and 64% of those on partial enteral nutrition (PEN).

Promisingly, clinical studies have suggested that EEN and PEN as well as elimination diets, though also hard to follow, may induce remission in newly diagnosed adults, maintain remission when biologic therapy has failed, and help avoid surgery in those with disease complications.

"Perhaps the most exciting development is the potential to induce and maintain remission by use of exclusion diets and partial enteral nutrition, which would enable wider use of dietary therapy across the spectrum," Levine and colleagues wrote.

For functional, IBS-like symptoms that persist during IBD remission, recent studies have shown that restricting fermentable oligo-, di-, monosaccharides and polyols (FODMAP) carbohydrates is effective. [Prince et al](#), for example, recently reported that 78% of patients reported satisfactory relief of functional symptoms after 6 weeks on the low-FODMAP diet.

One multicenter trial in CD is getting underway to compare the efficacy of the specific carbohydrate diet and the Mediterranean diet.

Treating Complications

One of the most promising areas for nutritional approaches is treating CD complications. Levine and colleagues pointed out that EEN has effectively treated inflammatory strictures, intra-abdominal abscess, and

enterocutaneous fistulae. "Use of preoperative exclusive enteral nutrition for 4 weeks or more may reduce the need for surgical resections," they wrote, adding that EEN has rapidly expanded from a tool for inducing of remission in children at disease onset to one with the potential to treat very complicated long-duration disease in adults.

Two recent studies from China evaluated the use of EEN in patients with complicated CD. [Hu et al](#) examined the effects of 12 weeks of EEN on inflammatory bowel strictures, comparing cross-sectional CT scans before and after therapy. A total of 64% of patients achieved clinical remission, while 54% had radiologic remission. This was accompanied by a significant increase in luminal diameter and a significant decrease in bowel wall thickness.

In a study by [Yan et al](#) looking at predictors of response to 12 weeks of EEN in CD patients with enterocutaneous fistulae, 62.5% had successful closure after EEN, with an average closure time of 32 days. And [Heerasing et al](#) demonstrated that 6 weeks of EEN led to avoidance of surgery in 25% of CD patients scheduled for elective resection.

Levine and colleagues said that although they were hopeful, high-quality evidence remains sparse and randomized controlled trials of the newer dietary interventions are urgently needed.

Gaps in Research

The gaps in research on dietary therapy for UC are even greater, and recommendations in that disease remain a mystery, Hou told the *Reading Room*. "Part of that has to do with the fact that we have more medical options for the routine management of ulcerative colitis, so patients are less likely to be searching for another type of therapy."

Most of the existing literature pertains to fiber-based diets that can increase short-chain fatty acids and influence the colonic microbiome. "There's been quite a bit of interest in modifying the diet to increase fiber and alter short-chain fatty acids in the colon, or actually delivering short-chain fatty acids to the colon via enema to treat UC," Hou continued. "But how much it benefits is

hard to say. There have been a couple of head-to-head non-inferiority trials of diet versus mesalamine, which were probably underpowered." He noted that adding 20 grams of fiber a day to the diet can result in significant discomfort for some patients.

Echoing that, Levine and associates wrote: "Although there are emerging clues linking diet to UC as well, researchers have yet to make the jump from bench to bedside in UC, and we still do not know if dietary therapy would be effective." The group is currently conducting an ongoing pilot study of diet and UC.