Food-Based Dietary Management of Crohn’s Disease; Are We There Yet?

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Diet · Dietary fibre · Inflammatory bowel disease

Abstract
Diet is a key modifier of risk of inflammatory bowel disease development and potentially a treatment option in patients with established disease. International organisations in gastroenterology and inflammatory bowel disease have published guidelines for the role of diet in disease onset and its management. Here, we discuss the major overarching themes arising from these guidelines and appraise recent literature on the role of diet for inflammatory bowel disease prevention, treatment of active disease and maintenance of remission, considering these themes. Except for exclusive enteral nutrition in active Crohn’s disease, we currently possess very little evidence to make any further dietary recommendations for the management of inflammatory bowel disease. There is also currently uncertainty on the extrapolation of epidemiological dietary signals on risk of disease development and preclinical experiments in animal models to management, once disease is established. Until high-quality evidence from clinical research becomes available, the only specific recommendations for inflammatory bowel disease we might safely give are those of healthy eating which apply for the general population for overall health and well-being.

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Knowledge Transfer

Background
Good evidence suggests that diet factors must be implicated in the development of inflammatory bowel disease (IBD) [1]. As a result, there have been several efforts over the past decade to develop food-based dietary therapies for the short- and long-term management of Crohn’s disease (CD) and ulcerative colitis [1]. Here, we summarize the findings of 2 recent multicentre randomized controlled trials (RCT) testing the effectiveness of 2 novel dietary therapies for IBD and discuss their implications for clinical practice [2, 3].

CDED: The Crohn’s Disease Exclusion Diet
The CD exclusion diet (CDED) is a food-based diet coupled with 50% partial enteral nutrition (PEN), designed to reduce exposure to dietary components which, based on animal research, negatively affect the gut microbiome and intestinal immunity. CDED consists of 5 mandatory foods (i.e., chicken, potato, apple, banana, eggs), excludes food containing additives, dairy products and gluten, limits red meat consumption, and encourages consumption of fibre, fruits and vegetables [1]. In the first multicentre RCT, 6 weeks of CDED plus 50%PEN was more tolerable but equally effective as exclusive enteral nutrition (EEN) to induce remission in 75% of children with CD; albeit the study was not powered for non-inferiority comparison [3]. Faecal calprotectin (FC) levels improved for both groups, with CD; albeit the study was not powered for non-inferiority comparison. CDED plus 50%PEN was more tolerable but equally effective as exclusive enteral nutrition (EEN) to induce remission in 75% of children with CD; albeit the study was not powered for non-inferiority comparison [3].

SCD: The Specific Carbohydrate Diet
The specific carbohydrate diet (SCD) is a food-based dietary therapy for IBD. It is based on anecdotal evidence that poorly absorbed disaccharides and polysaccharides promote the development of a pro-inflammatory gut microbiome [1]. Previous case reports and open-label trials reported positive efficacy signals for SCD in patients with IBD [1]. DINE-CD is the first large multicentre RCT study to assess the efficacy of a 12-week course of SCD to induce symptomatic remission compared with the Mediterranean diet (MD) [2]. In a well-designed study, patients were delivered meals for the first 6 weeks and given instructions on how to prepare their food and follow a SCD for the remaining 6 weeks. SCD was not superior to MD for symptomatic remission (6-week, SCD 46.5% vs. MD 43.5%) as well as quality of life and inflammatory marker improvement [2]. While these are positive signals, there was no comparative group on established induction therapy (e.g., EEN or steroids), and, most importantly, only a small proportion of patients had raised FC at study enrolment (i.e., SCD 24% & MD 15%), making it difficult to interpret efficacy signals and impossible to rule out placebo effects or improvement of functional symptoms rather than of active gut inflammation. In the small number of patients with raised inflammatory markers, including patients with marginally elevated levels, biomarker normalisation was only modest and no different between the 2 groups [2].

Conclusions for Clinical Nutrition Practice
Within the limitations of the research reported here, the data from CDED+PEN are promising; however, further independent research is required to prove the benefit of CDED in addition to that induced by 50%PEN alone. The additional value of CDED diet exclusions is unclear, particularly when considering that 50%PEN along with the daily intake of the 5 aforementioned mandatory foods should supply almost all energy requirements of an individual. It is also unclear why food containing certain food additives (e.g., maltodextrin, carrageenan, carboxymethylcellulose) and dairy products need to be excluded during CDED+PEN when these same food additives are ingredients of enteral feeds used in the management of active CD, and they also contain dairy protein and fat [5]. The methodological shortcomings of the DINE-CD study significantly limit the implications of the findings for clinical practice. Instead, one can assume that whilst MD or SCD do not offer much benefit in active CD management, they are unlikely to exacerbate disease activity in patients well controlled on background drug therapy. Until better quality data are produced, EEN remains the only established dietary therapy for active CD.

Disclosure Statement
The authors have been involved in research exploring the role of diet and nutritional therapies in the management of active Crohn’s disease. Professor Gerasimidis received research grants from Nestle Health Science and Nutricia-Danone.

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