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CORRESPONDENCE

From Low-Residue Diets to Plant-Based Diets in Inflammatory Bowel Disease

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To the Editor,

Available data strongly indicate that the greatest environmental factor in inflammatory bowel diseases (IBD) is diet-associated gut microflora [1] that can be altered by a westernized diet [2]. Le Leu et al. [3] reported that dietary red meat aggravates colitis, whereas resistant starch attenuates inflammation in dextran sulfate sodium-induced colitis in mice. The increasing consumption of meat and decreasing consumption of the fiber component, resistant starch, are principal characteristics the Western diet [4, 5]. Therefore, the study by Le Leu implicates detrimental these dietary changes as possibly etiological in the increasing prevalence of colitis as populations adopt Western culture.

At present, a low-residue diet (LRD) is recommended in IBD, although no evidence exists that a LRD is superior to a normal diet. Since the LRD lacks substrate for butyrate production, a key substance for the maintenance of colonic homeostasis [6], the LRD may be detrimental. This assumption has been studied in non-gastrointestinal diseases: on the basis of a large, prospective cohort study, Park et al. [7] reported that dietary fiber intake was significantly inversely associated with risk of total death and death from cardiovascular disease, infectious diseases, and respiratory diseases in men and women. Dietary fiber intake was also related to a lower risk of death from cancer in men.

We designed a semi-vegetarian diet for IBD that would provide adequate resistant starch with low meat content [2]. Meat is consumed only once in 2 weeks, whereas the diet contains a large amount of dietary fiber per 24 h: 32.4 ± 2.1 g (soluble dietary fiber 6.8 ± 0.7 g, insoluble dietary fiber 23.3 ± 1.6 g) in 2,000 kcal, the inverse of a LRD. In a small-scale observational study of adult Crohn's disease ($n = 22$), we reported excellent prevention relapse associated with consumption of the semi-vegetarian diet [2], adding to the variety of current chronic diseases attributed to an imbalance of gut microflora (dysbiosis) or dietary metabolites [8] and expanding on the concept that diet-associated gut microflora are a leading environmental factor not only for IBD but also for a variety of diseases that preferentially affect wealthy nations for which a plant-based diet (PBD) may be beneficial [9, 10].

We hope that clinical studies addressing the efficacy of a PBD in IBD are forthcoming, so that a safe and effective alternative to currently accepted medical therapy will be become widespread.

Conflict of interest None.

References

1. Chiba M, Tsuda H, Abe T, Sugawara T, Morikawa Y. Missing environmental factor in inflammatory bowel disease: diet-associated gut microflora. [Letter to Editor]. *Inflamm Bowel Dis*. 2011;17:E82–E83.
2. Chiba M, Abe T, Tsuda H, et al. Lifestyle-related disease in Crohn's disease: relapse prevention by a semi-vegetarian diet. *World J Gastroenterol*. 2010;16:2484–2495.
3. Le Leu RK, Young GP, Hu Y, Winter J, Conlon MA. Dietary red meat aggravates dextran sulfate sodium-induced colitis in mice

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whereas resistant starch attenuates inflammation. *Dig Dis Sci*. 2013;58:3475–3482.
4. Report of the Working Group on Arteriosclerosis of the National Heart, Lung, and Blood Institute. Arteriosclerosis, vol. 2. US-DHHS, PHS, NIH. Philadelphia: WB Saunders; 1981.
5. Heller SN, Hackler LR. Changes in the crude fiber content of the American diet. *Am J Clin Nutr*. 1978;31:1510–1514.
6. Hamer HM, Jonkers D, Venema K, Vanhoutvin S, Troost FJ, Brummer RJ. Review article: the role of butyrate on colonic function. *Aliment Pharmacol Ther*. 2008;27:104–119.
7. Park Y, Subar AF, Hollenbeck A, Schatzkin A. Dietary fiber intake and mortality in the NIH-AARP diet and health study. *Arch Intern Med*. 2011;171:1061–1068.
8. Wilson Tang WH, Wang Z, Levison BS, et al. Intestinal microbial metabolism of phosphatidylcholine and cardiovascular risk. *N Engl J Med*. 2013;368:1575–1584.
9. De Filippo C, Cavalieri D, Di Paola M, et al. Impact of diet in shaping gut microbiota revealed by a comparative study in children from Europe and rural Africa. *Proc Natl Acad Sci USA*. 2010;107:14691–14696.
10. Tuso PJ, Ismail MH, Ha BP, Bartolotto C. Nutritional update for physicians: plant-based diets. *Perm J*. 2013;17:61–66.