LETTER TO THE EDITOR

Probiotics, prebiotics, synbiotics and naturally fermented foods: why more may be more

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We read with interest the review article of Gionchetti et al [1], which elegantly summarizes the data surrounding probiotics in pouchitis. Probiotics are live microorganisms that, when ingested, confer health benefits. In recent years, others have expanded on this concept, and introduced the words ‘prebiotics’ and ‘synbiotics’ to the lexicon. Respectively, they are "a non-digestible food ingredient that beneficially affects the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon [2]" and a product that combines pre and probiotics synergistically. A final and relatively underexplored hypothesis is the role naturally fermented foods may play in health.

While the popularity of probiotics has surged in recent years, the idea that living organisms in food can be salutatory is not a new concept. As early as Genesis, it was noted that “Abraham owed his longevity to the consumption of sour milk,” and Plinius, a Roman, advocated fermented milk products for the treatment of gastroenteritis [3].

Prebiotics and synbiotics are logical next steps. Indigestible foodstuff, prebiotics, such as fructooligosaccharides, inulin, and transgalactosylated oligosaccharides, selectively promote bifidobacteria growth, and may enhance its efficacy. Synbiotics, combinations of bacteria such as Bifidobacterium longum and proprietary prebiotics (Synergy 1, an inulin-oligofructose growth substrate), have been tested in small trials for the treatment of gastrointestinal illness [4].

Many of these studies however have yielded conflicting results. While there is significant evidence for the benefit of probiotics concerning antibiotic-associated diarrhea, rotavirus-associated diarrhea and pouchitis, results are merely suggestive for irritable bowel syndrome and ulcerative colitis, and the evidence is altogether equivocal for Crohn’s disease and constipation [5]. Synbiotics have also yielded mixed conclusions. One double blind, randomized controlled trial of 18 patients evaluated the efficacy of a synbiotic for the treatment of active ulcerative colitis. The study found an improvement in mucosal inflammatory markers, and improved clinical appearance of inflamed areas; however, no significant difference was found in the clinical activity index between the treatment group, and placebo [6].

Naturally fermented foods (NFF), in contrast to pre, pro or synbiotics, do not consist of isolated species of bacteria or homogenous non-digestible food scaffolds. NFF refer to traditionally prepared items, which may contain multitudes of microorganisms - even some unidentifiable strains - as well as both digestible and non-digestible food. One study of naturally fermented dry Greek salami found no fewer than 348 lactic acid bacteria alone, including Lactobacillus curvatus, L. sake, L. plantarum, Weissella viridescens, W. hellenica, and countless other unidentifiable isolates [7]. Another study of artisanal daily products found 4379 isolates in 35 products [8]. Thus, the sum total of items in NFF may be orders of magnitude greater than pro, pre or synbiotics. Likely NFF represents a novel therapeutic avenue that has been thus far under-investigated.

Some evidence suggests more may be more. A randomized trial by Ishikawa among ulcerative colitis patients showed that the addition of bifido-bacteria-fermented milk (BFM) to standard treatment improved relapse rates from 90% to 27% versus standard treatment alone [9]. In this study, a probiotic and fermented food showed additive benefit when combined with standard treatment. In contrast, a study by Zocco demonstrated that lactobacillus when administered in conjunction with mesalamine showed no benefit over mesalamine alone among ulcerative colitis patients [10]. The latter study used a probiotic in isolation, without a fermented food product.

Another provocative study of HIV patients showed that yogurt supplemented with Lactobacillus rhamnosus Fiti, and produced by local women in a low-income community in Tanzania, resulted in an average increase of CD4 cell counts by 0.13 cells/ μL/ day among consumers [11]. Although this was an observational study, it would be interesting to compare, locally produced yogurt, industrially produced yogurt, isolated L. rhamnosis Fiti and placebo capsule in a prospective trial. If NFF offer unique benefits, the former would yield the best results.

NFF, which are inherently a collection of many distinct bacterial species and food substances, may be superior to isolated pro and synbiotics and, if so, would represent a new direction for gastrointestinal research. NFF may also yield other avenues of therapeutic strategy, which may otherwise go ignored in the current ‘one bacteria, one foodstuff’ paradigm. Studies that support NFF would be a vindication of traditionally prepared foods and food rules, a subject that has garnered a large following, and much publicity in the lay press [12]. NFF may offer health benefits that surpass both pro and synbiotics.

References


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