Probiotics and Prebiotics - are there Benefits for Older People?

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Probiotics are live microorganisms that, when administered in adequate amounts confer a health benefit on the host. A prebiotic is described as 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 (e.g. bifidobacteria and lactobacilli) in the colon that have the potential to improve host health. The prime target of such functional food ingredients is the gut, although there is emerging evidence that they may have beneficial effects at other sites in the body.

There is evidence that the microflora of the colon alters with age, with an increase in species diversity and lower numbers of bifidobacteria. In the late 1970’s Dr Mitsuoka demonstrated how the composition of intestinal flora changes in a lifetime, and how the amounts of bifidobacteria decrease with age, while colon diseases increase at the same time. The implications for health have not been established. In numerous human trials prebiotics have been shown to increase the numbers of bifidobacteria, but there are few studies in older people.

In older subjects, disorders of the gastrointestinal (GI) tract, such as diarrhoea and constipation, are the third most prevalent cause of visits to family doctors.

Diarrhoea is a frequent complication of antibiotic treatment (antibiotic associated diarrhoea: AAD) and is common in hospitals and chronic care facilities for older people. AAD usually occurs 2–8 weeks after treatment with antibiotics probably due to disruption of the intestinal microflora allowing overgrowth of opportunistic enteric pathogens, in particular Clostridium difficile. In a meta-analysis of 25 clinical trials (not all in older patients), probiotics had a significant effect on AAD incidence (overall Relative Risk = 0.43, p < 0.001). A randomised placebo-controlled trial in older hospitalised patients (mean age 74 years) receiving antibiotics, reported that a probiotic drink containing Lactobacillus casei reduced the incidence of diarrhoea (odds ratio 0.25) and prevented C. difficile infection (0% vs 17% in the placebo group). These results have been confirmed in another strain of L. casei. Fewer studies have been conducted with prebiotics and have not shown consistent results.

A number of clinical trials have been conducted with conventional and probiotic-enriched yoghurts and fermented milks in elderly subjects with constipation. Of 7 studies, 5 showed significant laxative effects and one showed a significant improvement in transit time. There are reports that prebiotics such as fructooligosaccharides, galactooligosaccharides and inulin exert mild laxative effects although in most cases...
studies to date the effects do not reach statistical significance.

Studies in animal models provide evidence that probiotics and prebiotics can beneficially influence various stages in the initiation and development of colon cancer. There is, however, limited evidence from epidemiological studies for protective effects of products containing probiotics and prebiotics in humans, but recent dietary intervention studies in healthy subjects and in polyp and cancer patients have yielded promising results on the basis of biomarkers of cancer risk (decreased cell proliferation and reduction in DNA damage in rectal biopsies), and in terms of grade of colorectal tumours5,6.

With regards to beneficial effects of probiotics and prebiotics at other sites in the body, the most well established is the effect on immune function which shows evidence of decline with age. Probiotic supplementation has been shown to improve immune biomarkers and to influence the incidence and duration of infections7,8.

Conclusion

Overall it may be concluded that the evidence for beneficial effects of probiotics and prebiotics in older people is promising, although more, larger scale intervention studies are warranted in most areas.

About the author:

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Professor Rowland has a BSc and PhD in Microbiology from University College London and is a Registered Nutritionist. He is Head of the Hugh Sinclair Unit of Nutrition in the Department of Food and Nutritional Sciences at the University of Reading UK. His research areas include the role of diet (in particular probiotics, prebiotics, phytoestrogens and phytochemicals) in health and reduction in risk of chronic disease.

Ian is the author of over 300 papers and has been awarded an Honorary Doctorate from the University of Gent for his work on nutrition and cancer risk.

References: