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Probiotics in Health

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ABSTRACT
Probiotics are live microorganisms promoted with claims that they provide health benefits when consumed, generally by improving or restoring the gut microbiota. Probiotics are considered generally safe to consume, but may cause bacteria-host interactions and unwanted side effects in rare cases. Probiotics, like lactic acid bacteria, are non-pathogenic microbes that exert health benefits to the host when administered in adequate quantity. This review emphasizes the recent advances in the health benefits of probiotics. The most significant barrier associated with probiotics in the food industry is their susceptibility to processing conditions and sensitivity to gastrointestinal (GI) stresses.

Key words: Probiotics, Lactobacilli, Gut microflora, Intestinal disease

I. INTRODUCTION

Probiotics are foods and/or supplements that contain non-pathogenic microbes such as bacteria and yeast that colonize the gut and can potentially yield a variety of health benefits. Human beings consume a significant number of pathogens every day, primarily bacteria. For several decades, probiotic microorganisms have been utilized in several diets due to their positive effects on human health.[1] The World Health Organization (2014) defines probiotics as live cultures of microorganisms that confer a health benefit on the host when administered in adequate amounts. Research has highlighted success in many areas of medicine with the eight known classes of probiotics.[2,3] These successes include the treatment of diseases related to the gastrointestinal tract and oropharyngeal infections.[4]

The most commonly used strains belong to the genera Lactobacillus and Bifidobacteriumgenera that are commonly found in the oral cavity, including caries lesions. Probiotic Lactobacillus and Bifidobacterium strains have been reported to exert potentially beneficial effects for the oral health.[5] Porphyromonas gingivalis, Aggregatibacter actinomycetemcomitans, Tannerella forsythus, and Treponema denticola are established periopathogens covering red and green complex of Socransky colour coding. Streptococcus oralis and Streptococcus uberis have reported to inhibit the growth of pathogens both in the laboratory and animal models. They are indicators of healthy periodontium. When these bacteria are absent from sites in the periodontal tissues, those sites become more prone to periodontal disease.[6]

MECHANISM OF ACTION

Major probiotic mechanisms of action include enhancement of the epithelial barrier, increased adhesion to intestinal mucosa, and concomitant inhibition of pathogen adhesion, competitive exclusion of pathogenic microorganisms, production of anti-microorganism substances and modulation of the immune system. The intestinal epithelium is in permanent contact with luminal contents and the variable, dynamic enteric flora. The intestinal barrier is a major defense mechanism used to maintain epithelial integrity and to protect the organism from the environment. Defenses of the intestinal barrier consist of the mucous layer, antimicrobial peptides, secretory IgA and the epithelial junction adhesion complex[7]. Once this barrier function is disrupted, bacterial and food antigens can reach the submucosa and can induce inflammatory responses, which may result in intestinal disorders, such as inflammatory bowel disease[8,9,10] Consumption of non- pathogenic bacteria can contribute to intestinal barrier function, and probiotic bacteria have been extensively studied for their involvement in the maintenance of this barrier. However, the mechanisms by which probiotics enhance intestinal barrier function are not fully understood.

HEALTH ATTRIBUTES OF PROBIOTICS

Probiotics help in the prevention and management of allergic diseases, cancer, hypercholesterolemia, irritable bowel syndrome, diarrhea, lactose intolerance, inflammatory bowel disease.

PROBIOTIC BACTERIA FOR ORAL HEALTH:

The most commonly used strains belong to the genera Lactobacillus and Bifidobacteriumgenera that are commonly found in the oral cavity, including caries lesions. Probiotic Lactobacillus and Bifidobacterium strains have been reported to exert potentially beneficial effects for the oral health: Lactobacillus rhamnosus GG (ATCC 53103) produces a growth inhibitory substance against Streptococcus sobrinus and it has been proposed to reduce the risk for Caries.[11]

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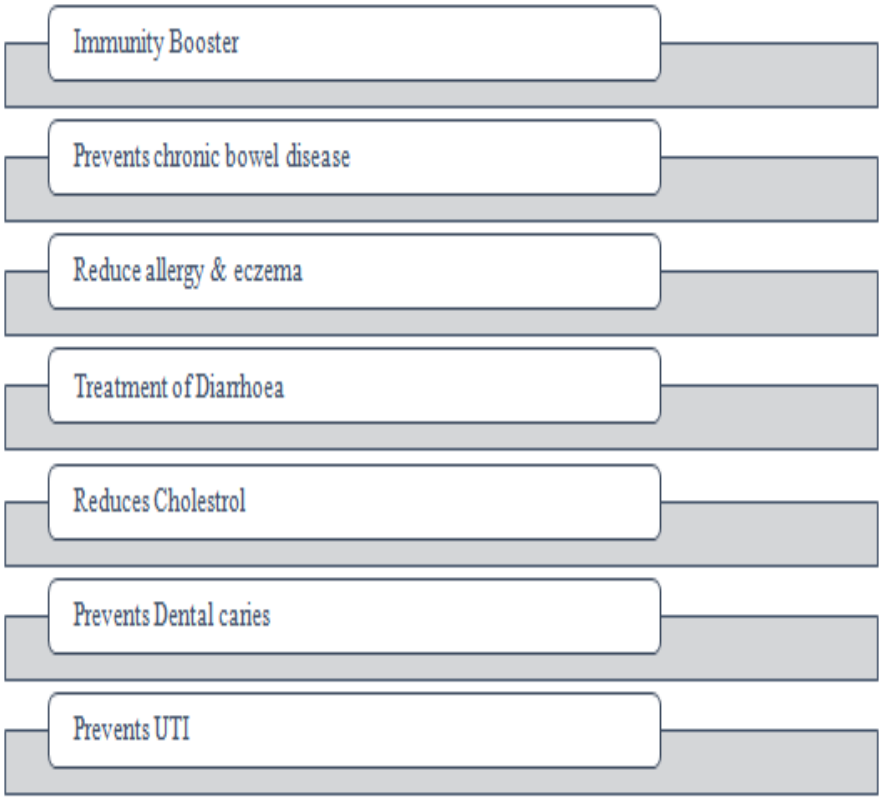
APPLICATIONS OF PROBIOTICS IN THE FIELD OF MEDICINE: FOOD ALLERGY:

Food allergy is an immunological disease that may have a high impact on the quality of life of both patients and their relatives, with economic consequences for the patients and the NHS (National Health Service)

In recent years many studies focused on the comprehension of molecular and immunological mechanism of allergic response and, in particular, it has been demon- strated the importance of gut microbiota for the maintenance not only of intestinal physiology, but also for the correct development of the immune system and the induction of oral tolerance. Growing evidence indicates that dietary factors as probiotics, prebiotics, antioxidants, polyunsaturated fatty acid, folate and vitamins have positive effects on the immune functions. In particular probiotic strains show the ability to restore intestinal microbic equilibrium and modulate activation of immune cells.[12]

BENEFITS OF PROBIOTICS



The positive effects of probiotics on patients with food allergies are a result of their combined impact on the gut's non-immunologic and immunologic defense barriers. The natural dietary protein's immunomodulatory characteristics are altered by lactobacilli. Probiotics affect the immune system by stimulating the gastrointestinal lymphoid tissue's lymphoid cells.[13,14]

Chronic Bowel Disease (Inflammatory Bowel Disease)

Inflammatory bowel disease (IBD) is a chronic inflammatory condition that affects the digestive system. IBD includes Crohn's disease (CD), ulcerative colitis (UC), and indeterminate colitis (IC), which are distinguishable based on where the GI tract inflammation is located.[15] A recent study found that probiotic supplementation appears to be a workable adjuvant therapy for UC and not for CD in individuals with inflammatory bowel disease. As a reason, there is presently insufficient knowledge concerning probiotics' efficacy to make broad recommendations for treatment in CD patients.[16]

SOURCE OF PROBIOTICS

Live bacteria and yeasts are known as probiotics, and they may be good for one's health. They can be found in some meals and supplements as well as in the human digestive system. Probiotic

bacteria are beneficial. They are found all over the body, although most people only think of the stomach and intestines when they think of them. Fermented foods such as yogurts and kimchi are sources of probiotics. Additionally, probiotic supplements are also available.

II. CONCLUSION

There is a pronounced need for large, carefully designed (randomized, placebo controlled) clinical trials of probiotics that undertake broad sampling of host microbiota, have clear end points, and have well informed participants who consent to treatment. Investigations like these are needed to overcome the placebo effect and other barriers to the thorough investigation of probiotic products.

At present, the quality of probiotics available to consumers is unreliable. Testing to ensure the identity of the organisms within probiotic products, the potency of those organisms, the purity of the products, and their shelf life needs to be put in place. Moreover, these parameters should be verified by the appropriate regulatory bodies. The number of non- probiotic organisms present in probiotic products needs to be evaluated and kept within the limits allowed by food standards when intended for use as food.

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