

Role of Probiotics in Pediatrics

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Probiotics are increasingly being used in pediatrics because of the health benefits attributed to them. Probiotics are defined as “live microorganisms, which when administered in adequate amounts confer a health benefit on the host” [1]. The probiotic concept was first introduced by the Nobel Prize laureate, Ilya Ilyich Mechnikov in 1908 during his study about yogurt-derived health-boosting effects on Bulgarian peasants. Metchnikoff considered the lactobacilli as probiotics (“probios”, conducive to the life of the host as opposed to antibiotics); probiotics could have a positive influence on health and prevent aging [2].

Probiotics include bacteria such as bifidobacteriae, lactobacilli, streptococcus and yeast such as saccharomyces. They are part of the intestinal microbiota which also includes other bacteria, viruses and fungi. All these organisms contribute to the genomes which are referred to as intestinal microbiome. The microbiome provides pathogen colonization resistance in the gut. Hence it is an important component of the immune system. An imbalance between the types of organism present in a person’s natural microflora, especially that of the gut, which is referred to as intestinal dysbiosis is thought to contribute to a range of conditions of ill health, both intestinal and extra-intestinal disorders. Intestinal disorders include inflammatory bowel disease (ulcerative colitis, Crohn’s disease), irritable bowel syndrome (IBS), and coeliac disease, while extra-intestinal disorders include allergy, asthma, metabolic syndrome, cardiovascular disease, and obesity [3]. Today the role of probiotics has been recognized as an important alternative approach to normalize the gut microbiota. Triggered by the growing knowledge on the link between dysbiosis and many health problems, there has been intensive interest and research on probiotics.

Probiotics have been used together with prebiotics. Prebiotics are non digestible fiber found in many fruits, vegetables and whole grains that provide a beneficial physiological effect for the host. They are mainly fructo oligosaccharides and galacto saccharides. Prebiotics which are also in breast milk are food for the probiotics, stimulating the favorable growth or activity of probiotics, thereby promoting a healthy intestinal microbiotic environment. Their combination is referred to as symbionts [4].

The best evidence has been provided for the use of probiotics, namely lactobacilli and saccharomyces, in acute gastroenteritis and antibiotic associated diarrhea (AAD) [5]. It has been observed that gastrointestinal symptoms in children with autism are often linked to their behavior. Currently probiotics are hypothesized to positively impact their gut microbiome and altering positively their behavior. This gut - brain connection is linked to “leaky gut” which enables inflammatory peptides produced by bacteria in the digestive tract to reach the brain. This is putatively said to lead to the abnormal behavior in these children and is currently an area of intense research [6,7].

In spite of mounting reports of positive outcomes with the use of probiotics, many of the benefits of probiotics have not been confirmed in well - conducted randomised controlled trials.

There is now a global increase of probiotic market. With so many probiotic preparations on the market today there is a need to understand the various probiotic strains and preparations commercially available.

Probiotics are safe and well tolerated in normal, healthy infants and children. Good tolerance has been observed in preterm infants and very low birth weight babies. However, adverse effects have occurred sporadically. There needs to be continued research taking into account optimal strain/s/combinations, dose, duration of use, etc. while providing probiotics as a standard prophylaxis for preterm infants and use for patients with other pediatric conditions [8]. But the shortcomings of clinical trials must be appreciated. Current clinical and fundamental research thinking is moving into the paradigm of systems medicine/biology. This is a more integrated approach which aims at understanding the behavior of entire biological systems and to recognize the perturbations or alteration in the function of a biological system brought about by exposure to any biological product, environmental stimuli and lifestyle changes (particularly diet). It is hoped that with the new research (computational and mathematical) tools used, the research findings will provide clinicians with a better understanding of the beneficial effects of particular strains of probiotics for use in pediatrics [9].

Establishment of microbiome in the human body starts from birth. The mother passes the probiotics from the delivery in the vaginal canal and thereafter from breast feeding. So the role of pediatricians in promoting a healthy microbiotic environment in the newborn baby through the promotion of breastfeeding, judicious use of antibiotics (avoiding unnecessary use of antibiotics) as well as providing appropriate nutritional counselling for older children cannot be underestimated.

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