

painful stimuli. Future studies should aim to report effect of these measures on long-term cognitive and behavioral outcomes.

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Probiotics and Allergic Rhinitis

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Allergy is a hypersensitivity reaction initiated by immunological mechanisms to substances that, in the majority of people, cause no symptoms and clinically manifests as atopic eczema, rhino-sinusitis, conjunctivitis or asthma. During the current era, there has been an increase in prevalence of allergic disorders which is attributed to changes in environmental-host factors. The so-called “hygiene hypothesis” (Microbial deprivation syndrome) suggests that a lack of exposure to microbial stimulus early in childhood is a major factor involved in this trend. This provides a rationale for using probiotics to modify the gut microbial flora, thereby altering the immune response of the host (from Th2 to Th1) and reducing the symptoms of allergy.

There is a recent surge in studies on the effect of probiotics on the clinical symptoms and medication use among children with established allergic diseases. Probiotics are products or preparations containing viable numbers of microorganisms that are able to modify the host’s microflora, thereby producing beneficial health effects [1]. Lactobacilli are considered to induce reactions involving Th1 cells and to improve allergic diseases. In the article published in this issue of the

journal [2], it has been concluded that *Lactobacillus salivarius* treatment reduces rhinitis symptoms and drug usage in children with allergic rhinitis. A meta-analysis of the published randomized controlled trials studying the effect of probiotics on allergic disorders revealed nine of the 12 RCTs showing an improvement due to the use of probiotics. All the RCTs that studied perennial allergic rhinitis showed lower symptom scoring and medication use with the use of probiotics compared with placebo [3]. There is also evidence from animal models and *in vitro* studies that gut micro biota modulate immune programming, promote oral tolerance, and are important inhibiting the development of the allergic phenotype.

However, the therapeutic effect of prebiotics or probiotics may be reduced once colonization and the allergic phenotype are established compared with treatment at younger ages when there is greater plasticity. It has also been studied that probiotics have some beneficial role in reducing the allergic disorders in the children when given to their mother during the third trimester of pregnancy and also in the newborn period before colonization occurs [4]. After a decade of research in the field of allergy and probiotics, no general recommendations for their use can be given [5]. There are

a few trials, with positive and negative both results and only a limited number of strains have demonstrated benefits in the area of preventing allergic diseases. Hence, this hypothesis needs to be studied in detail before drawing any necessary conclusions.

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