

EDITORIAL

MUCOSAE, ALLERGY AND PROBIOTICS

The mucosa of the digestive and respiratory systems share certain elements involved in immune defense. Consequently, their joint participation in an allergic disease in which both mucosal systems are linked, with distinct clinical expression of each, cannot be ruled out since the mucosa of the respiratory and digestive systems show a certain functional unity in their capacity for immune response. Certainly, in the mucosa of both organ systems, there are, on the one hand, lymphocytes (CD3 + : CD4 and CD8), mast cells and plasma cells, with marked production of secretory IgA and on the other, a lymphatic system, included under the term mucosal-associated lymphoid tissue (MALT), which in the digestive system is composed of tonsils, adenoids, the appendix and Peyer's patches (GALT: gut-associated lymphoid tissue), while in the respiratory mucosa this system is represented by aggregates of lymphocytes distributed throughout the respiratory tract, with a greater concentration in the tracheobronchial bifurcation (BALT: bronchial-associated lymphoid tissue), exercising a similar defensive function in both¹.

Alterations in intestinal permeability and bacterial flora have been found in allergic patients with atopic dermatitis and respiratory disease, suggesting that there is a functional nexus between the respiratory and digestive mucosal systems related to the elements they share in immune response. Over the years, various studies have demonstrated that intestinal permeability is increased in allergic patients, facilitating the passage of allergy-inducing protein antigens from the diet²⁻⁴.

There are more than 400 species of bacteria in the gastrointestinal tract, of which only 30-40 account for 99 % of the microorganisms that comprise normal flora, which varies in the distinct portions of the digestive tract, as well as with diet and age. These microorganisms have a strong influence on many biochemical and immunological characteristics, actively participating in the digestion of the basic elements of the diet, carbohydrates, fats, proteins and amino acids⁵. The colon is the stretch of the intestine that is richest in bacteria, generally composed of two genera or species. One with mainly proteolytic activity, in which Clostridium, Peptostreptococcus and Bacteroides play a role, and another, represented by Bifidobacterium, Eubacterium and Lactobacillus, which are saccharolytics, whose action is believed to be more beneficial. Several studies have demonstrated that the genus Clostridium predominates in neonates with a lesser presence of bifidobacteria, which are represented by B. adolescentis, and are found in older

individuals⁶. Undoubtedly, both the increase in permeability and alterations in intestinal flora play an important role in the pathogenesis of allergic diseases, especially those due to food sensitization and perhaps also those of the respiratory system. Replacement of intestinal flora in allergic children is viewed as a measure that could contribute to controlling the most common allergic diseases. To achieve this, the use of probiotics is proposed, which are defined as "food supplements with live or inactivated bacteria that have beneficial effects and reduce the risk of nutritional diseases and disorders"⁷. The desired properties of the microorganisms present in probiotics are that they are of human origin, resistant to pancreatic enzymes and biliary acids, that they adhere easily to the intestinal mucosa so that they are more able to modulate immune response, that they do not cause collateral effects and that the technology used to obtain the product is validated to ensure its composition and quality⁶.

Probiotics act by reducing intestinal inflammation, since, to a certain extent, Gram-positive microorganisms correct lymphocyte imbalances, as they are powerful stimulators of the Th1 cytokines, IL-12 and IFN-gamma. Moreover, some of the lactobacilli and bifidobacilli that can be administered favor IgA production and reduce IgE production by increasing the uptake of antigens by Peyer's patches, and also improve intestinal processing of antigens ingested in the diet, among other favorable effects.⁶

Since Majamaa et al⁸ first proposed probiotic administration as a complementary treatment for food allergy, several studies have tried to verify its effectiveness as a complementary therapy in allergy to cow's milk proteins, atopic dermatitis and respiratory allergies. As was to be expected, several studies have shown that the greatest benefits seem to have been achieved in digestive and cutaneous diseases provoked by allergy to cow's milk. However, since evaluation based on clinical criteria is extremely difficult, more extensive studies are required to confirm the effectiveness of this treatment⁹⁻¹¹. More debatable are the results in respiratory disease, with only one published study, reporting improvement in the quality of life in children with allergic rhinoconjunctivitis who received *Lactobacillus paracasei*-33, but with little improvement in symptoms¹².

Primary prevention has also been investigated in two studies published by the same authors. *Lactobacillus GG* was administered to pregnant women at high risk for atopy for the last 4 weeks of pregnancy and the first 3 months of breastfeeding and to neonates for the first 6 months of life. In both studies, the frequency of atopic eczema at 2 years was significantly lower in the group of children who received preventive treatment than in those who did not^{13,14}, suggesting that prevention is effective or at least that it delays the appearance of allergic disease, which could appear after the second year of life.

In summary, as has often been stated, further studies to confirm the utility of probiotics in the treatment and prevention of allergic disease should be performed with the participation of research teams from various centers.

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