

Probiotics are they Really Necessary?

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We can find multiple commensal bacteria in the human intestine known as microbiota that are related in a symbiotic way with their host influencing their physiology and facilitating or hindering the presence of infectious diseases or deficiency states based on regulation and development of the host's immune system. It can trigger an inadequate response, leading to the appearance of pathological processes against antigenic structures typical of autoimmunity, structures of the microbiota causing an inflammatory bowel disease or against environmental antigenic structures causing the presence of atopy [1,2].

Today, the modulation of this microbiota population is emphasized by functional foods that add a beneficial effect on health to their nutritional aspect. Therefore we can distinguish:

- Probiotics that are live microorganisms that, when administered to the host, produce a health benefit.
- Prebiotics that are non-digestible carbohydrates but that favor the growth of beneficial bacteria.
- Symbiotic which is an association of probiotics and prebiotics [3,4].

Probiotics have been used in multiple pediatric pathologies, especially in gastrointestinal pathologies that alter the saprophytic intestinal bacterial flora as occurs in cases of infectious gastroenteritis, in cases of overgrowth of a portion of commensal bacteria and in recent years in the disease intestinal inflammation or in functional problems such as colic or constipation in infants [5-9].

However, although the pharmaceutical industry has included them in their food presentations, especially in milk, paediatricians have a hard time incorporating this information into our daily practice, and this is due to the disparity of the results in the investigations. That definitive guidelines for its use and treatment have not yet been established.

According to the World Health Organization, the strains that are shown to be beneficial with a degree of evidence 1a and 1b are [10-13]:

- Acute infectious diarrhea: *L. rhamnosus* GG and *S. boulardii*.
- Prevention of diarrhea due to antibiotics: *L. rhamnosus* GG, *S. boulardii*, *B. lactis* and *S. thermophilus*
- Functional bowel disorders: *L. rhamnosus* GG and *L. reuteri*
- Prevention of necrotizing enterocolitis of the newborn: *L. acidophilus*, *B. bifidum* and *B. infantis*
- Ulcerative colitis VSL # 3

Each probiotic uses a different method of action and varies in their degree of colonization and resistance, so their clinical efficacy also varies, so we will have to take into account these specific effects of each strain to indicate the probiotic appropriate to each clinical situation, even varying doses as specified in published clinical trials [14-16].

The best evidence of the beneficial use of probiotics in pediatrics corresponds to acute infectious diarrhea, based on the use of mechanisms involved in the stimulation of the immune system, competition for adhesion to intestinal cells and the manufacture of substances

that neutralize the pathogenic germs. Thus in diarrhea a beneficial effect has been observed from the third day of administration of *Lactobacillus rhamnosus* GG, *Lactobacillus reuteri* and *Saccharomyces boulardii*, especially in case of rotavirus infections [17,18].

However, drawing definitive conclusions is difficult due to the different methodology used by each researcher, using different species and variable doses. There are even reviews in which the authors conclude that the use of probiotics associated with rehydration solutions is a safe and beneficial system by shortening the days of diarrhea by reducing the number of bowel movements and the number of bowel movements, although more are needed. studies to establish it as the basis of a treatment. Therefore, the main clinical practice guidelines and protocols assess the use of probiotics whose efficacy is proven and at safe doses [19].

In antibiotic diarrhea several studies have concluded that the association of probiotics with the antibiotics administered to the patient would decrease the risk of diarrhea induced by the selection of antibiotic resistant strains, although there are no conclusive studies available to routinely associate them with *S. boulardii* and *Lactobacillus* GG have been shown to be effective in reducing the incidence of diarrhea, but some adverse effects have been described, such as the fungal spread associated with *S. boulardii* or bacteraemia with certain probiotics in immunosuppressed patients or with central catheters [20].

In cases of *Clostridium difficile* diarrhea, the WHO recommends the use of *S. Boulardii* as a prevention, demonstrating that it would act as a prophylactic measure, reducing health costs due to hospital admissions and treatment measures, readmissions, morbidity and possible cases. of mortality [21].

Patients affected by inflammatory bowel disease can benefit from the use of probiotics by modifying the microbiological flora of the host favoring immune activation and although there are few data that are of this association, they are encouraging. Thus, based on the recommendations published in the global guide on probiotics and prebiotics of the World Gastroenterology Organization published in 2016, the strains *E. coli* Nissle 1917 and *Lactobacillus* GG would be effective together with the treatment of mesalazine to achieve the remission of these patients. Finally, the VSL # 3 mixture has been shown to be effective in the induction of remissions and its maintenance in children with mild and moderate ulcerative colitis.

The consensus between EPSGHAN and ECCO on pediatric ulcerative colitis suggests the use of probiotics in case of intolerance to 5-ASA or even as a co-adjuvant treatment in cases of persisting residual activity with conventional therapy, although there are risks in immunosuppressed patients and carriers of catheters intravenous centrals. However, in Crohn's disease the results are mixed in the use of probiotics. It has been proven how the VSL # 3 mixture with rifaximin is more effective than mesalazine in cases of remission after surgical resection, preventing the initial crisis of pouchitis (entity of unknown house that consists of nonspecific inflammation of the ileo-anal reservoir) and avoiding future relapses after remission with antibiotics.

Current reviews agree that probiotics decrease irritable bowel symptoms, especially *Bifidobacterium* species such as *Lactobacillus* and *E. coli* DSM 17252. In addition, in several trials, the use of VSL # 3 for 5 - 6 months has shown that improve all percentages of symptom score.

In cases of functional-type abdominal pain, the use of probiotics is based on improving functional permeability, immune regulation and the inflammatory response thus regulating intestinal motility, especially in the use of *Lactobacillus* GG.

In constipation, probiotics have been used to try to reestablish the imbalance of the gut microbiota found in children who suffer from it, although this efficiency is not clearly established. Thus, probiotics increase the retention of water in the faeces, favoring the growth of *Bifidobacteria*, which causes an increase in stools and a decrease in their consistency, making stool evacuation easier. Inulin and fructooligosaccharides are laxatives depending on the dose of use since they increase the microbial biomass by increasing colonic fermentation [22,23].

The use of probiotics in infants suffering from colic is based on the alteration of the microbiota, improving their intestinal motility in addition to acting directly on the nerve pathway that controls visceral pain. Thus *Lactobacillus reuteri* DSM 17938 strains are effective, without notable clinical adverse effects [24].

Patients diagnosed with *Helicobacter pylori* infection should undergo a triple therapy based on proton pump inhibitors or bismuth citrate together with double antibiotic therapy with amoxicillin and clarithromycin or metronidazole for 1 or 2 weeks, so the rate of Resistance rises reducing the effectiveness of the treatment, from 90% to 65% in endemic areas, not forgetting the undesirable side effects due to the changes induced by the antibiotics in the microbial flora of the patient caused by the amount of antibiotic that remains residual in the intestine. A meta-analysis has shown that *S. boulardii* together with the antibiotic favors an elevated *H. pylori* eradication rate and at the same time decreases the appearance of collateral effects of the treatment, especially diarrhea. Other probiotics have not been conclusive, and further studies are needed to evaluate efficacy and safety in terms of species, strain and optimal dose [25,26].

Probiotics have been shown to be useful in cases of intolerance to lactose by modifying the intestinal microbiota, since they favor the tolerance of milk to be degraded by bacterial enzymes, especially lactase, improving their digestive capacity and decreasing the ability of the stomach to empty quickly. Some strains such as *Lactobacillus acidophilus* and *Lactobacillus bulgaricus* carry enzymes such as beta-galactosidase and lactase, increasing digestion of lactose. Thus, probiotics do not reduce lactose intolerance, although they may improve symptoms in patients that are significantly affected by it, although it is not a systematic recommendation for all patients with lactose intolerance.

Celiacs are cases of special patients. We must understand that in celiac disease, bacteria that favor inflammation predominate with fewer symbiotic bacteria that would favor the toxicity of gluten as well as the inflammatory response developed by the host. The studies published to date, although they do not demonstrate scientific evidence on the use of probiotics in celiac patients and their effect on the restoration of the composition of the intestinal microbiota, however it is not ruled out that in the future the use of probiotics or Symbiotics improve the quality of life of these patients [27].

Currently, WHO has declared obesity as the pandemic with the greatest impact on the world population, and especially on children. This has shown that in the obese mice there is a modification of the intestinal microbiota that would influence the homeostasis of the lipids and glucose, favoring the development of a mass of adipocytes and an inflammatory response that would trigger the onset of insulin resistance, type 2 diabetes and cardiovascular diseases. Therefore, the appearance of novel treatments that act on the gut microbiota with specific bacteria such as *Bifidobacterium* would be a fundamental objective as a preventive treatment for obesity [28].

Finally, we must highlight other processes such as malnutrition in which there is a risk of bacterial overgrowth and secondary immunodeficiency that could be altered by improving the intestinal barrier function with probiotics; cystic fibrosis, ideal candidate patients in the use of probiotics for its anti-inflammatory and immunomodulatory properties by decreasing intestinal permeability and finally in cases of food allergies and atopic diseases in which probiotics would favor the immune mechanisms of tolerance [29].

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