

Dysbiosis: Intestinal Flora is Really Important?

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Abstract

Intestinal dysbiosis refers to the loss of balance between the intestinal own bacteria and the pathogens. It is an alteration in the composition of our intestinal microbiota and is related to various aspects such as lifestyle, diet or stress. The diet can influence the composition of our intestinal microbiota and could be related to the genesis of various pathologies. Recent studies have found differences between the microbiota of patients with certain diseases and healthy individuals. Among these diseases, we find Multiple Sclerosis, Parkinson's disease, lupus, inflammatory bowel diseases, Alzheimer's disease, obesity and other metabolic disorders such as diabetes. Taking care of the health through a balanced diet with contribution of prebiotic and probiotic foods, and maintaining healthy lifestyle habits such as regular physical activity, resting properly, preventing stress, eliminating tobacco and alcohol, and avoiding unnecessary antibiotic and sugar abuse, seem a fundamental pillar to avoid important disease-forming pathologies.

Keywords: *Dysbiosis; Intestinal Flora; Microbiota*

The microbiota is the set of microbial communities that we can find in human mucous membranes. They are approximately 100 billion of more than 400 different species [1]. Intestinal dysbiosis refers to the loss of balance between the intestinal own bacteria and the pathogens. It is an alteration in the composition of our intestinal microbiota [2]. The appearance of dysbiosis is related to various aspects, such as lifestyle, diet or stress, genetic factors and the intake of antibiotics. It is important to emphasize that the microorganisms in our intestines fulfil an important immune function, defending us against the proliferation of pathogenic bacteria. To carry out this function, the energy obtained through the nutrients is necessary. Currently, we know how the diet can influence the composition of our intestinal microbiota, and how it could be related to the genesis of various pathologies [3].

Recent studies have found differences between the microbiota of patients with certain diseases and healthy individuals. Multiple Sclerosis, Parkinson's disease, lupus and inflammatory bowel diseases are among these diseases [4]. Another publication provides interesting data regarding the gut-brain axis, focusing on Alzheimer's disease. The results indicate how intestinal bacteria could influence the production of proinflammatory cytokines related to the development of the disease and how the type of diet we follow can influence the microbial balance of our intestine [5].

Another important aspect that is currently being investigated is the relationship between our intestinal microbiota and our immune system; Some studies, such as the one developed by researchers at the University of Calgary in Canada and the August Pi i Sunyer Biomedical Research Institute (IDIBAPS), underline that our intestinal microbiota regulates and influences the immune system [6].

Over the past 10 years, the important role of our intestinal flora in obesity and diabetes has also been demonstrated. It has been observed that the changes in both the quantity and the composition of our microbiota can be a fundamental element in the modulation of metabolic function, energy regulation and intestinal inflammation [7].

The intestinal microbiota interacts with the surface of the intestinal mucosa. A well-balanced microbiota maintains the function of intestinal epithelial barrier. The alteration of the function of this intestinal barrier allows the translocation of endotoxins, microbial components and microbial metabolites that will allow its passage to the systemic circulation, which can induce immune responses and lead to systemic inflammation. In the blood of patients with cardiovascular disease and chronic kidney disease, bacterial DNA has been detected, and in those patients with higher concentrations of bacterial DNA, inflammatory markers were identified in plasma, such as high-sensitivity C-reactive protein and interleukin 6 [8]. The vast majority of neoplastic changes in humans occur through environmental exposure, lifestyle, and diet. An emerging concept in cancer biology implicates the microbiota as a powerful environmental factor modulating the carcinogenic process [9].

Within the category of intestinal dysbiosis, we find a condition known as SIBO (small intestine bacterial overgrowth). It is a bacterial overgrowth at the level of the small intestine. In the specific case of our digestive tract as we get closer to the large intestine, the concentration of bacteria increases. Thus, in the stomach the amount of bacteria is not very high due to the acidity that prevails this area, in the first section of the small intestine (duodenum) we find 10^4 CFU/ml, and in its final section (ileum) 10^7 CFU/ml. In the large intestine, it is where we find the highest concentration of bacteria (10^{12} CFU/ml) [1]. It is considered that there is a bacterial overgrowth in the small intestine, when there is an increase in the number of bacteria in the proximal small intestine above 10^5 CFU/ml, which would lead to a series of consequences, such as inflammation of the intestinal mucosa. When this inflammation occurs, our intestine is not able to properly absorb nutrients, such as fatty acids, carbohydrates, proteins, minerals or vitamins, and can generate significant nutritional deficiencies. Symptoms of SIBO are nonspecific and include abdominal pain, belching, bloating, diarrhea, distension, flatulence, and indigestion that overlap and vary in frequency, duration, and severity. These are symptoms that can also be found in pathologies such as food intolerances, Celiac disease or irritable bowel, so sometimes the differential diagnosis is difficult. Several factors are associated with or predispose patients to SIBO, including small intestinal dysmotility. The goal of the treatment for patients with SIBO is symptom relief by eradicating overgrowth of bacteria [10].

Conclusion

Alterations at the level of the intestinal microbiota is related to different pathologies, however more studies are necessary to establish whether the existence of intestinal dysbiosis is the cause or consequence of the presence of these pathologies. In any case, taking care of the health of our intestinal flora through a balanced diet, with the provision of prebiotic and probiotic foods, maintaining healthy lifestyle habits such as regular physical activity, resting properly, preventing stress, eliminating tobacco and alcohol and avoiding the of abuse antibiotics and sugars seem a fundamental pillar to avoid important and very prevalent pathologies.

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