

Gut Dysbiosis

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Abstract

Introduction: The interest reached by the medical community of the intestinal microbiota, its alteration as a cause of dysbiosis and relationship in health and disease is exposed.

Objectives: Review the most recent criteria related to gut dysbiosis.

Discussion: The role of the intestinal microbiota and its microbiome in health and disease, the value of the omic methods for its knowledge and the participation of the imbalance of the intestinal microbiota in the production of dysbiosis, the predisposing factors, causes, effects, are exposed. intestinal and systemic diseases related to dysbiosis and the action of intestinal modulation in the dysbiosis management.

Conclusion: Attention is drawn to the importance of gut dysbiosis as a decisive factor in the production of digestive and extradigestive diseases in childhood and adult individuals and the value of the manipulation of the intestinal microbiota for its treatment.

Keywords: Gut Dysbiosis; Intestinal Microbiota

Introduction

The knowledge gained in relation to the intestinal microbiota, its composition and complex diversity has represented in recent years of great interest to the medical community [1-3]. Multiomics studies have been a decisive contribution to deepen their phyla, genera and strains when determining their composition (metagenomics), functionality (metabolomics), genes and their expression (metaproteomics) and information on regulatory networks (metatranscriptomics), using 16S or 18S rRNA sequencing [4].

The intestinal microbiota is a heterogeneous and complex community of living microorganisms that inhabit the gastrointestinal tract, with variations in its proportion in its different parts, mainly composed of bacteria. More than 100 genera and 1000 bacterial species have been identified and in its minority by components, still little investigated, such as viruses, which represent the so-called "intestinal viroma" and micro-eukaryotes (fungi and protozoa). Likewise, the intestinal microbiome is the set of microorganisms of the intestinal microbiota, its genes and metabolites [5].

Discussion

Abnormal intestinal colonization determines a state of dysbiosis that modifies its composition and diversity, causing aggression in the stability of the microbiota. This alteration is the result of an "imbalance of the gut microbial community". The dysbiosis induce changes

qualitative and quantitative in the microbiota that directly affect homeostasis, immunological and nutritional mechanisms of intestinal microbiota. produced among the commensal, pathogenic and potentially pathogenic bacteria, called pathobionts, with the consequent predominance of them, with varying harmful effects on the health of the human organism [6].

Dysbiosis may appear from birth due to prematurity, cesarean section and the use of perinatal antibiotics by affecting the symbiotic interaction of commensal bacteria and mechanisms of prevention and defense of the intestinal mucosa, leading to the appearance of long-term diseases of life, like allergies. Occasionally early weaning and the introduction of oral solid feeding may cause slight modifications. and contribute to a late colonization until 4 - 6 years [7].

Among the determining factors of intestinal dysbiosis, the use of antibiotics, improper feeding, inflammation, stress and medications, among the most important, are highlighted [8].

Dysbiosis determines that the important functions of the microbiota are not fulfilled, especially protection and defense, and the conditions for inflammatory processes of the intestinal mucosa with damage to the function of the immune responses of the intestine are established, which will affect production of intestinal and extraintestinal or systemic conditions [8,9].

Intestinal diseases include infectious diarrhea, antibiotic-associated diarrhea, necrotizing enterocolitis and inflammatory bowel diseases, and extra-intestinal diseases, including liver diseases (liver steatosis, non-alcoholic steatohepatitis) [10], allergies [11], obesity [12-14] type 2 diabetes mellitus [15,16] neuropsychiatric diseases [17] (depression, anxiety and autism) [18-20] and in neurological development [21].

Disorders of intestinal permeability resulting from inflammation of the intestinal mucosa and its epithelium caused by dysbiosis play an important role in the production of diseases, as it can cause bacterial translocation with severe consequences for the health of the host [22]. There are a number of conditions of the pathogenesis of dysbiosis, such as 1) protein fermentation, with the production of a high number of metabolites that establish harmful direct contact with the mucosa of the colon and interact with the colonocytes, with harmful effects, 2) Affectation of the population of sulfate reducing bacteria, whose beneficial effect on inorganic sulfur, prevents the damage of sulphites, 3) alterations of immune, endocrine and inflammatory mechanisms triggered by pathogenic or potentially pathogenic microorganisms present in the microbiota, interfere with its functions, 4) bacterial overgrowth of *Candida albicans*, due to its metabolic activity it develops certain products, such as ethanol and acetaldehyde, which are harmful to the body.

In the light of the most recent contributions, healthy lifestyle, adequate diet consumption, administration of probiotics and prebiotics, anti-inflammatories, immunomodulators and nutraceuticals to prevent or as therapies for the management of dysbiosis are insisted [23-29].

Final Considerations

The modulation of the intestinal microbiota acquires a new approach, based on the experiences accumulated in studies and research of the last 20 years, as the role of dysbiosis as a determining cause or associated with different diseases has been demonstrated, for which the use of existing probiotics is limited. This state will be overcome by having new specific probiotics that solve the imbalance of the microbiota. In this sense, the Probiotics Next Generation will be able to be used as a new alternative for the modulation of the intestinal microbiota and considered as health promoters, as has happened, in some of them with their respective hosts, where they have been isolated [30].

Conflict of Interest

The author declares no conflict of interest.

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