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Opinion Article

Significance of Gut Microbiota Dysbiosis in Metabolic Health and Eating Disorders

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DESCRIPTION

The gut microbiota influences various aspects of human physiology, such as digestion, metabolism, immunity, and brain function, through the production of metabolites, modulation of gene expression, and interaction with the nervous and endocrine systems. The gut microbiota also shapes the host's nutritional status, by affecting the absorption, utilization, and storage of nutrients, as well as the appetite and satiety signals. However, the gut microbiota can also be disrupted by various factors, such as diet, antibiotics, stress, infection, and aging, leading to a state of dysbiosis, which is defined as an imbalance in the composition, diversity, and function of the gut microbiota. Dysbiosis can have detrimental effects on the host's health, and has been associated with various nutritional disorders, such as obesity, diabetes, malnutrition, and eating disorders. Obesity is influenced by both genetic and environmental factors, and the gut microbiota is one of the key environmental factors that modulates the host's energy balance and weight regulation. Dysbiosis in obesity is characterized by a lower diversity and richness of the gut microbiota, a higher ratio of *Firmicutes* to *Bacteroidetes*, and an increased abundance of pro-inflammatory and obesogenic bacteria, such as *Lactobacillus*, *Enterobacteriaceae*, and *Methanobrevibacter*. These dysbiotic bacteria can enhance the energy harvest from the diet, increase the intestinal permeability, induce chronic low-grade inflammation, and alter the production of hormones and neurotransmitters that regulate appetite, satiety, and glucose homeostasis. Therefore, dysbiosis can contribute to the development and maintenance of obesity, and modulating the gut microbiota through dietary interventions, probiotics, prebiotics, or fecal microbiota transplantation may be a potential strategy to prevent or treat obesity. Dysbiosis in diabetes is characterized by a lower diversity and richness of the gut microbiota, a lower abundance of beneficial bacteria, such as *Akkermansia*, *Faecalibacterium*, and *Roseburia*, and an increased abundance of harmful bacteria, such as *Bacteroides*, *Prevotella*, and *Ruminococcus*. These dysbiotic bacteria can impair the production of short-chain fatty acids, which are important for maintaining the intestinal barrier, modulating the immune system, and enhancing the insulin signaling. Dysbiotic bacteria can also increase the intestinal permeability, induce chronic low-grade inflammation, and alter the production of hormones and neurotransmitters that regulate glucose metabolism and insulin secretion. Therefore, dysbiosis can contribute to the development and progression of diabetes, and modulating the gut microbiota through dietary interventions, probiotics, prebiotics, or fecal microbiota transplantation may be a potential strategy to prevent or treat diabetes. These dysbiotic bacteria can impair the digestion and absorption of nutrients, increase the intestinal permeability, induce chronic inflammation and infection, and alter the production of hormones and neurotransmitters that regulate appetite, satiety, and nutrient sensing. Therefore, dysbiosis can contribute to the development and exacerbation of malnutrition, and modulating the gut microbiota through dietary interventions, probiotics, prebiotics, or fecal microbiota transplantation may be a potential strategy to prevent or treat malnutrition. Eating disorders are influenced by various factors, such as genetic, psychological, social, and environmental factors, and the gut microbiota is one of the key environmental factors that affects the host's eating behavior and mental health.

CONCLUSION

Dysbiosis in eating disorders is characterized by a lower diversity and richness of the gut microbiota, a lower abundance of beneficial bacteria, such as *Bifidobacterium*, *Lactobacillus*, and *Faecalibacterium*, and an increased abundance of harmful bacteria, such as *Clostridium*, *Enterobacteriaceae*, and *Streptococcus*. These dysbiotic bacteria can impair the production of short-chain fatty acids, which are important for maintaining the intestinal barrier, modulating the immune system, and enhancing the brain function. Dysbiotic bacteria can also increase the intestinal permeability, induce chronic inflammation and infection, and alter the production of hormones and neurotransmitters that regulate eating behavior, mood, and stress. Therefore, dysbiosis can contribute to the development and maintenance of eating disorders, and modulating the gut microbiota through dietary interventions, probiotics, prebiotics, or fecal microbiota transplantation may be a potential strategy to prevent or treat eating disorders.

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