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NUTRITION AND GUT MICROBIOTA, DIFFERENT GUT-AXES

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Gut microbiota (GM) is a complex, dynamic, and heterogeneous ecosystem comprised of bacteria, viruses, fungi, and protozoa that colonise the gastrointestinal tract. GM has a symbiotic relationship with the host and regulates both local and systemic physiological functions. The GM profile of each individual is unique and is influenced by various factors such as genetics, nutrition, lifestyle, environmental conditions, early microbial exposure and the immune system. Dysbiosis is regarded as any imbalance in composition and/or function of microbial ecology. Considering the influence of GM is extended not only to the gastrointestinal tract, a concept of multiple bidirectional gut-organ axes has been suggested. In that sense, the effect of dysbiosis can be observed in different organ systems. Dysbiosis leads to mucin degradation, disruption of gut barriers, increased permeability and consequently local and systemic infiltration of pathogenic microorganisms and their by-products. This invasion leads to immune cells activation and systemic inflammation affecting the heart, the liver, kidneys and central nervous system. Nutrition plays a critical role in regulating the multiple gut-organ axes. Specific dietary patterns have been shown to affect the abundance and prevalence of certain bacterial strains thus affecting the GM homeostasis. The intake and ratio of macro- and micronutrients highly impacts the susceptible GM balance and can exert both harmful and favourable effects. Additionally, supplementation with certain probiotics, prebiotics and synbiotics promotes local protective mechanisms that lead to antiinflammatory effects, exerting systemic beneficial outcome. Gut modulation through nutrition and therapy-tailoring according to individual health profile is a promising tool for targeting various diseases, emphasizing the pivotal role of nutrition in shaping human health.

Keywords: Microbiota, Dysbiosis, Nutrition, Gut-Organ Axes