EDITORIAL

Gut Microbiota and Chronic Diseases and Conditions

The role of the microbiota in determining health and disease is complex and not completely understood. Gut microbiota plays an important regulatory role in human physiology, from regulation of the intestinal mucosal barrier, nutrient uptake and metabolism, and immune system maturation to mechanical protection against pathogens present in the intestinal lumen [1]. An interesting aspect that has emerged in the last few years is the complex interplay between gut microbiota, innate and adaptive immune system, and several mediators of inflammation that exist at the site of the intestinal mucosa, and it is possible to consider this variegated network as a part of the ‘immunological niche’ [2].

For these reasons, this mini thematic issue discusses the influence of gut microbiota and the possible consequences of its manipulation in patients suffering from chronic conditions, such as cancer and diabetes, and in patients who experience acute diseases.

The crosstalk between the microbiota and the immune system may be one of the reasons underlying the importance of microbiota in autoimmune conditions and inflammatory immune-mediated diseases [3]. Piccioni et al. [4] have examined this topic and reviewed 68 articles focusing on the role of probiotics in autoimmune and inflammatory disorders. Based on their findings, they suggest the introduction of probiotics as standard therapy to promote microbiota eubiosis.

Probiotics can directly modulate the microbiota, but another possibility is its modulation through specific compounds. Cassini C. et al. [5] examined the effects of phenolic compounds that exert both antimicrobial and prebiotic activities. They suggested the use of nanotechnologies to improve their actions and overcome the problems associated with their delivery and metabolism.

Microbiota modulation may be considered more important in the context of low-intensity diseases, yet there is growing evidence that there may be a place for it in the context of the intensive care unit (ICU). Zanza C. et al. [6], for instance, observed a number of changes in the composition of the gut microbiota, which may be associated with worse outcomes in frail patients. On the other hand, manipulation of gut microbiota may not only be a predictor of worse outcomes but also be a therapeutic tool in preventing complications.

The complexity of the interactions between the host and the microbiota is clear when discussing the role of the latter in the pathogenesis and development of chronic diseases such as diabetes. Cianci et al. [7] studied the pathways involved in the interaction between visceral adipose fat and the microbiota, exploring different aspects of a disease commonly considered only an endocrine disorder, and examining the role of the microbiota in this endocrine pathway.

Also, in cancer, another extremely complex disease, microbiota appears to be capable of modifying both tumor growth and response to therapy. D’amico et al. [8] explored these aspects and also the possible results of microbiota modulation on tumor prevention and therapy, discussing the current developments.

Overall, microbiota and its modulation are interesting fields, both in terms of pathogenesis and therapy for a growing number of complex diseases. In particular, the possibility of using microbiota manipulation in the context of complex diseases and even in emergency settings is an exciting perspective that should be explored in future studies.

REFERENCES


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