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Effect of intestinal microbiota on health

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Abstract

Some tissues and organs of the body provide a suitable environment for the colonization of many organisms which are as whole known as the human microbiota. The gastrointestinal tract, which contains a large number of microorganisms, is one of the major examples of such a suitable environment in this context. The gut microbiota plays a key role in many situations. Among some of the situations in which it plays a role; both defense and physiological development of the host, and some events that are expressed metabolically can be counted. In general, the composition of the microbiota can be affected by some factors (such as antibiotic use, stress, lifestyle, and dietary habits). Characterization of the gastrointestinal tract from healthy individuals; strengthening the beneficial microflora, regulating the microflora, and maintaining the body functions both regularly and in a healthy way are among the therapies considered to overcome some metabolic and inflammatory disorders. In this proceeding we will discuss intestinal microbiota and its effects on the health.

Introduction

Different microorganisms in the human microbiota colonize some tissues and some organs of the body. Gastrointestinal system, genital system, nose, skin, throat and mouth are among the settlement areas of these microorganisms in the human microbiota. The gastrointestinal tract is characterized as a suitable environment for colonization in terms of some of its features (such as its large surface area), and it hosts a large number of microorganisms. Bacteroidetes, Actinobacteria, Firmicutes, Verrucomicrobia and Proteobacteria are considered to be the dominant microorganisms in the gastrointestinal tract [1-3].

The intestinal microbiota, which is controlled by the disease-preventing, constructive or enhancing bacteria and is known as a complex ecosystem, plays primary roles in both the defense and physiological development of the host [4, 5]. A symbiotic relationship develops between the host and the microorganisms in the gut. Thanks to this relationship, the number of harmful bacteria in the intestine is kept at a minimum level [6, 7].

It is known that the intestinal microbiota is involved in some events, both immunologically, physiologically and metabolically, and in addition to these events, the abrupt changes in the intestinal microbiota is also effective in the pathogenesis of some diseases [8, 9].

Since the gut has a very large immunological ecosystem, there is a relationship between the immune system and the intestinal microbiota [10]. The gut microbiota, which affects the immune response to many bacterial antigens and immunogens, is also involved in the immune development of the host [5, 11]. IgA is the immunoglobulin class with the highest production in the intestine. Secretory IgA (sIgA) plays a role in controlling the intestinal microbiota and preventing the spread of toxins and pathogenic microorganisms [10].

In general terms, the microbiota, which has duties in human disease and health, can be affected by many external factors. Among these external factors; lifestyle, geographical origin, nutritional habits, gender, age, genetic status, antibiotic use, stress and some previous diseases can be listed. In this context, the microbiota is greatly

affected by nutritional status. In addition to the factors mentioned above, factors such as host secretion and pH can also affect the microbiota composition [3, 7, 9].

Disruption of the intestinal microflora balance and alteration of the flora is expressed as dysbiosis. Dysbiosis, which causes changes in intestinal permeability, can be associated with some gastrointestinal and extraintestinal diseases [9, 12].

Results

In order to maintain the body functions in a regular and healthy way, it is necessary for the gastrointestinal system to be healthy. The regulation of the intestinal microflora and the strengthening of the beneficial microflora are among the effective factors in the realization of this situation. In this direction, probiotics and prebiotics can be used [9, 13].

Live microorganisms that have beneficial effects on the health of their hosts when taken in appropriate amounts are coined as "probiotics" [12, 14]. In this context, some of the effects of the probiotics include; contributions to the stronger functions of both the immune system and intestinal health, providing the balance between the pro-inflammatory response and anti-inflammatory response in the intestine, preventing some deteriorations that may occur in the microflora of the intestine (by controlling the proliferation of undesirable yeasts and bacteria) [1, 10, 11].

In line with some effects of the probiotic microorganisms, the proliferation of the pathogenic microorganisms can be prevented. Some of the effects of the probiotic microorganisms in this context include the secretion of some antimicrobial peptides and lowering the pH value of the intestine [15].

Bifidobacterium, Lactobacillus and Streptococcus species are among the important microorganisms frequently used as probiotics [12].

Nutrients can stimulate the effectiveness of some microorganisms with beneficial properties in the intestine and the ones that play a role in the multiplication of these microorganisms are known as “prebiotics” [13, 16]. Prebiotics play a role in increasing the effects of probiotics, protecting and improving the health of the host [11, 12].

Galacto-oligosaccharides, insulin, and fructo-oligosaccharides are given as examples of some compounds with prebiotic properties [12].

Breast milk contains some oligosaccharides with prebiotic properties. Oligosaccharides in breast milk play an important role in shaping the microbiota of the infant gut [2, 17].

Discussion and Conclusion

It is thought that better examination and understanding of the microbiome activity will be effective in opening new doors in the treatment of human diseases and drug development methods for the future, and studies in this context are continuing. A greater focus on the immune system's connection both to the probiotics and the microbiota could also be beneficial for therapeutic applications against inflammatory and autoimmune disorders [1, 18].

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