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Perspective

Exploring the Microbiome-Immune System Connection in Autoimmunity

Elif Akin*

Department of Medicine, Bahcesehir University, Istanbul, Turkey

DESCRIPTION

The human body is a complex ecosystem, hosting trillions of microorganisms that make up the microbiome. While these microorganisms inhabit various parts of our body, a significant portion resides in the gut. Recent research has shed light on the profound impact of the microbiome on our overall health, particularly in relation to the immune system. The microbiome is an intricate network of bacteria, viruses, fungi, and other microorganisms that coexist within us. The gut microbiome, in particular, is a densely populated ecosystem, with over a thousand different species working in harmony to maintain a balanced environment. These microorganisms perform significant functions such as aiding in digestion, synthesizing vitamins, and even influencing our mood and behavior [1,2].

The immune system is our body's defense against harmful pathogens, such as bacteria, viruses, and foreign substances. It comprises various cells, tissues, and molecules that work together to recognize and eliminate these threats. However, this intricate defense system is not without flaws, and sometimes, it can turn against the body itself, leading to autoimmune diseases. Autoimmune diseases occur when the immune system mistakenly identifies the body's own cells and tissues as threats and attacks them. These diseases can affect virtually any part of the body, from the skin and joints to the organs and nervous system. Common autoimmune diseases include rheumatoid arthritis, multiple sclerosis, and type 1 diabetes. The exact causes of autoimmune diseases remain elusive, but researchers have begun to uncover the role of the microbiome in triggering and exacerbating these conditions [3,4].

Research has shown that the microbiome plays a pivotal role in shaping the development and function of the immune system. During infancy and early childhood, the microbiome undergoes a dynamic process of maturation, which is significant for training the immune system to distinguish between friend and foe. Exposure to a diverse range of microorganisms during this vital period is thought to be essential for immune system education. The gut microbiome exerts a continuous influence on the immune system throughout one's life. Gut bacteria help modulate the immune response, maintaining a delicate balance between activation and suppression. They do so through various mechanisms, such as producing anti-inflammatory molecules and interacting with immune cells in the gut lining [5,6].

When the balance of the gut microbiome is disrupted, a condition known as dysbiosis occurs. Dysbiosis can result from various factors, including the overuse of antibiotics, a diet high in processed foods, and chronic stress. In dysbiosis, harmful microorganisms may proliferate, and beneficial ones may dwindle. This imbalance can lead to an overly active or dysfunctional immune system, potentially triggering or exacerbating autoimmune diseases. The gut-immune axis is a bidirectional communication system between the gut and the immune system. Through this axis, the gut microbiome can influence immune responses throughout the body. For example, studies have shown that gut bacteria can produce metabolites that either promote inflammation or dampen it. The composition of the gut microbiome also affects the types of immune cells present in the gut and their behavior [7,8].

Additionally, the gut barrier, which separates the gut lumen (where the microbiome resides) from the bloodstream, plays a vital role in immune regulation. A compromised gut barrier, often referred to as "leaky gut," can allow harmful substances and bacteria to enter the bloodstream, triggering an immune response and potentially contributing to autoimmune reactions. Several autoimmune diseases have been linked to alterations in the gut microbiome. For instance, in individuals with rheumatoid arthritis, researchers have observed differences in the composition of gut bacteria compared to healthy individuals. Similarly, studies in multiple sclerosis have shown that the gut microbiome can influence disease progression and severity [9].

Understanding the microbiome-immune system connection in autoimmunity is a gifted avenue for future research and therapeutic interventions. Manipulating the gut microbiome through probiotics, prebiotics, or dietary changes is a growing area of interest. By restoring balance to the gut microbiome, it may be possible to modulate immune responses and potentially alleviate symptoms of autoimmune diseases. The relationship between the microbiome and the immune system is a burgeoning

Correspondence to: Elif Akin, Department of Medicine, Bahcesehir University, Istanbul, Turkey, E-mail: elifakin@gmail.com

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field of research that holds great potential in unraveling the mysteries of autoimmune diseases. While much work remains to be done, it is increasingly clear that the microbiome plays a pivotal role in shaping immune responses and may be a key factor in the development and progression of autoimmune conditions [10].

REFERENCES

1. Rukmini C, Sathiya Moorthy P, Viswanathan P, Krishnamoorthy P. Antioxidant potentials of flaxseed by *In vivo* model. J Agric Food Chem.2004;52(5):1391-1395
2. Orthen N, Gambill M. Blockade of histamine receptors in the treatment of obesity. J Am Osteopath Assoc. 1988; 88(11): 1429-1431.
3. Pilar F, Dehaene S, Lambert J. Bridging levels of consciousness: Dynamical aspects of neural top-down control. Curr Opin Neurobiol.2018;49:218-230.
4. Navarro-Badenes J, Martínez-Mir I, Palop V, Rubio E, Morales-Olivas FJ. Weight gain associated with cinnarizine. Ann Pharmacother.1992;26(7-8):928-930.
5. Dhikav V. Can phenytoin prevent Alzheimer's disease? Med hypotheses.2006;67(4):725-728.
6. Ratliff JC, Barber JA, Palmese LB, Reutenauer EL, Tek C. Association of prescription H1 antihistamine use with obesity: Results from the National Health and Nutrition Examination Survey. Obesity. 2010;18(12):2398-2400.
7. Mahadik SP, Evans D, Lal H. Oxidative stress and role of antioxidant and ω-3 essential fatty acid supplementation in schizophrenia. Prog Neuropsychopharmacol Biol. Psychiatry. 2001;25(3):463-493.
8. Mahadik SP, Evans D, Lal H. Oxidative stress and role of antioxidant and ω-3 essential fatty acid supplementation in schizophrenia. Prog Neuropsychopharmacol Biol. Psychiatry. 2001;25(3):463-493.
9. Dkhil MA, Al-Quraishy S, Abdel Moneim AE. *In vivo* effect of cinnarizine on the liver of mice. J basic appl zool.2007 49(3), 107-117
10. Gilbert PE, Brushfield AM. The role of the CA3 hippocampal subregion in spatial memory: A process oriented behavioral assessment. Prog Neuropsychopharmacol Biol Psychiatry. 2009;33(5):774-781.