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The Role of the Digestive System in the Formation, Preservation and Strengthening of Immune

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Annotation. A feature of the human digestive system is its open connection with the external environment. At the same time, at the level of the small intestine, where active digestion processes (intracavitary, parietal, intracellular) take place, homeostasis (physical, chemical, biological, including the genetic constancy of the internal environment) must be maintained in order to preserve the integrity and individuality of the macroorganism.

Key words: digestive system, treatment, disease, method, remedy.

INTRODUCTION

Protection of the human digestive system is provided by the acidic environment in the stomach and active pepsin, which are detrimental to most infectious agents; autonomic (vegetative) innervation of organs; motor activity (peristalsis) of the gastrointestinal tract (GT); the work of the sphincter and valve apparatus; secretions of the digestive glands into the lumen of the intestinal tube (primarily bile and pancreatic juice); secretion of gastrointestinal hormones, immunoglobulins. The protective function of GT is also provided by its own lymphoid tissue and microbiota (intestinal microflora). One of the most important sites of interaction between foreign antigens from food and the human immune system is the GT mucosal surface. The GT immune system is part of the mucosa-associated lymphoid tissues (MALT) system.

MATERIALS AND METHODS

The formation of the digestive organs of the fetus in fetal development depends on the state of health and nutrition of the mother. For newborns and young children, the immaturity of nonspecific defense factors, cellular and humoral immunity in the first months of life is provided by the components of the mother's immune system that have entered the body transplacentally. Breastfeeding provides immunological protection of the child due to the immunoglobulins and other protective factors that enter the body with mother's milk. Formula-fed children are characterized by increased susceptibility to infections of various origins.

RESULTS AND DISCUSSION

Immunity disorders of an innate nature (primary immunodeficiencies), as well as those resulting from the impact of various unfavorable factors for the body (secondary immunodeficiencies), lead to the failure of immune defense and the development of the disease.

Primary immunodeficiencies often manifest in early childhood and can be fatal in case of a severe immune

defect or late diagnosis and initiation of treatment [1, 2]. Severe immunodeficiency is often based on a genetic defect, the recognition of which and family history can clarify the nature of the immunodeficiency. Successes in the treatment of this category of patients are associated with the use of bone marrow transplantation, intravenous administration of immunoglobulin, and antibiotic therapy [2, 3].

One of the reasons for the development of secondary (acquired) immunodeficiency is malnutrition, such as: exhaustion, protein-energy deficiency, deficiency of microelements (zinc, selenium, etc.), vitamins (A, C, E, folic acid, etc.). .), excess in the diet of fats, carbohydrates, leading to obesity and the so-called "metabolic syndrome".

In obesity, excess lipids affect proliferation, cytokine synthesis, activity of natural killer cells, and phagocytosis. This is due to changes in membrane fluidity, the formation of lipid peroxides, eicosanoids, and changes in gene expression. With hyperlipidemia, the phagocytic activity of macrophages, neutrophil chemotaxis, and activity of lymphocytes in the reaction of blast transformation to mitogens decrease.

In protein-energy deficiency, cell-mediated immune responses primarily suffer: a decrease in the number of CD3 + T-lymphocytes; a decrease in the proliferative response of lymphocytes to T-cell mitogens; inhibition of the synthesis of cytokines (interleukins-1, 2, etc.); decrease in the killing of microbes by phagocytes.

Vitamins (especially fat-soluble vitamins) have a pronounced effect on immunity. Deficiency of water-soluble vitamins leads to a weakening of cellular immunity, but an increase in their intake only slightly stimulates it. Vitamin C activates the function of neutrophils and natural killer cells, stimulates the humoral response. Vitamin A activates a specific immune response in infections, the synthesis of immunoglobulins G and A, stimulates phagocytosis, enhances the production of interleukin-10 by macrophages, and reduces the level of tumor necrosis factor. Vitamin E increases phagocytic activity, stimulates the production of interleukin-2; reduces the proliferative activity of lymphocytes.

Zinc is an antioxidant and regulator of immune system function. With its deficiency, the number of thymocytes (thymus cells, the central organ of the immune system in childhood and adolescence), the level of thymus hormones, the activity of “natural killer” cells, T-helpers, neutrophils, and antibody production decrease.

Selenium is an antioxidant that regulates the level and function of natural killer cells. With its deficiency, phagocytosis and cytotoxic activity of “natural killer” cells are disturbed, the content of CD4+ T-lymphocytes decreases, and the humoral immune response is suppressed.

Nevertheless, the irrational and uncontrolled use of vitamins (especially fat-soluble, capable of cumulating in the body), antioxidants (blocking lipid peroxidation, a mechanism used by immune system cells to damage the antigenic structures of microorganisms) can lead to adverse consequences for organism.

"Natural" transient immunodeficiencies can occur both in early childhood and in advanced, senile age. They can occur in pregnant women, as well as be seasonal (such short-term immunodeficiencies are more common in winter and early spring). Their main feature is that the body is able to restore the resulting disorders on its own without the development of severe complications. Eubiota disorder (GT dysbiosis) is a common clinical syndrome associated with overgrowth of opportunistic microflora [3].

More severe immunodeficiencies (associated with oncopathology, HIV infection, immunosuppressive therapy, etc.) are usually accompanied by opportunistic infections that are not characteristic of a person with normal immunity [3]. The latter are "markers" of such severe immunodeficiencies.

CONCLUSION

In all these cases, maintaining both the normal functional state of the digestive organs and the composition of the intestinal microflora are protective factors for maintaining the homeostatic function of the gastrointestinal tract and the normal functioning of the human immune system. Dietary recommendations are based on the observance of such a diet that would ensure not only the normal functioning of the body under normal conditions, but also a “margin of safety” in the event of adverse effects on the body of certain environmental factors. It is necessary to focus both on an adequate ratio of body height and weight, energy intake from food (caloric content of the diet) with the energy expenditure of the body, and on the

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composition and indicators of the general and biochemical analysis of blood, morphometry of blood cells, indicators of the acid-base state of biological fluids , immunogram, electrocardiogram, determine exercise tolerance and a number of other physiological indicators, as well as assess a person's well-being. Modern food and pharmaceutical industries allow nutritional and pharmacological correction of functional deviations in the activity of the digestive system from the standpoint of effective and safe intervention in the formation, maintenance and strengthening of the human immune system. But, despite significant progress in the development and use of immunocorrective drugs and dietary supplements, many facts are still not sufficiently understood and require further research and evaluation from the standpoint of "evidence-based medicine".

REFERENCES

1. Golubeva L.V., Dolmatova O.I. New types of milk-containing products with increased functional and preventive properties [Text] // Collection of scientific works "Modern world, nature and man". Tomsk, 2017. V.4, No. 1. P.134.
2. Golubeva L.V., Dolmatova O.I. New technologies for fortified dairy products. Monograph [Text] // Voronezh. state un-t. eng. tech. Voronezh, 2013. 104 p.
3. Golubeva L.V., Dolmatova O.I., Chuguevskaya V.A. The use of non-traditional components of plant origin in the production of curd products [Text] // Dairy River, 2012. No. 1, pp. 52-54