

MORPHOFUNCTIONAL STATE OF THE FORMATION OF THE IMMUNE SYSTEM OF THE MUCOUS MEMBRANE OF THE SMALL INTESTINE

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ABSTRACT

During the development of children and adolescents, the immune system adapts to changing environmental conditions and coordinates immunological mechanisms with neuroendocrine regulation of body functions. The pathology of the immune system affects the work of other organs and systems, and the immune system reacts to the pathology of other body systems. It is particularly sensitive to metabolic disorders that disrupt the work of immunocompetent cells and cytokine production.

KEYWORDS: neuroendocrine, laws, regulations, religious traditions, immunocompetent cells.

INTRODUCTION

Currently, research in theoretical and clinical immunology has achieved significant success.^[1] Due to the significant development of these scientific directions and their implementation in practical medicine, the interest in studying the structural and functional features of various organs and systems in General is understandable. Numerous publications that have appeared in recent years reflect various aspects of the morpho-physiology of the Central and peripheral organs of the immune system. A significant part of scientific achievements is in demand in practice, implemented in studies of immunomorphology and ultrastructure of lymphoid organs in norm, experiment and pathology. These achievements provide a better

understanding of the individual characteristics of the immune system in normal, pathological, primary and secondary immunodeficiency, which are so common at present.^[2,4] The scientific data obtained in recent years contribute to a better understanding of the cellular foundations of immunity, the mechanisms of immunological recognition, and the nature of intercellular relationships in the formation of the immune response.^[3,7]

However, as correctly pointed out by M. R. Sapin and JI. E. Etingen (2006), many issues of morphogenesis of the immune system organs currently remain poorly understood, such as the relationships that develop between different organs of the immune system during postnatal ontogenesis. Research on the morphology of human immune system organs in postnatal ontogenesis is also insufficient.^[5]

More and more, the object of research is the questions of structural and functional changes in the immune system under various environmental and anthropogenic influences.^[7,12] with a variety of physical stresses.^[8] Immunomorphological studies performed on laboratory animals.^[10] The proportion of studies of human immune system organs (in morphological terms) is constantly decreasing.^[11] To a significant extent, this is due to objective difficulties (laws, regulations, religious traditions, etc.) in studying the actual sectional material. To a large extent, this applies to the lymphoid apparatus of the colon, including its recto-sigmoid Department. It should be noted that the large intestine as a whole, namely its structural and functional organization, has been studied much less in comparison with other internal organs-the stomach, small intestine, and pancreas. In Index Medicus for 2003 there are more than 80 publications on various issues of small bowel morphology, but no more than 10 devoted to General and specific morphology of the colon, which is associated with significant methodological and practical problems that arise when removing the recto-sigmoid part of the intestine, including the anal canal of the rectum in the perineum. It is necessary to take into account the rapid onset of autolytic changes in the mucosa of the rectosigmoid colon.

Summarizing the above, it should be noted that both the General morphology of the recto-sigmoid colon and questions of a particular nature are clearly not sufficiently developed. To a greater extent, this concerns aspects related to the study of the morphology of the lymphoid apparatus of the recto-sigmoid Department, which occupies a strictly defined position among the peripheral organs of the immune system. Knowledge of the structural and functional features of the lymphoid tissue of this part of the intestine is especially important, given the wide distribution of intestinal microflora in this part of the colon.^[17]

Data on the General morphology of the lymphoid structures of the recto-sigmoid colon are few, scientifically outdated, and obtained on insignificant factual material, sometimes not normally, but in pathology. It should be recognized that from a morphological point of view, the lymphoid apparatus of the recto-sigmoid part of the intestine is to some extent a "white spot" on the map of the anatomy of the human immune system. There are almost no normative data on the nature of lymphoid formations (stage of morphogenesis of lymphoid tissue, etc.),s their distribution in the intestinal walls, regional features, age-related transformations of the lymphoid apparatus, sexual and individual differences in lymphoid structures, and their cellular composition. These data are necessary when taking into account the significant spread of various diseases of the recto-sigmoid part of the intestine (acute and chronic colitis, diverticula, etc.),^[5] and especially in malignant pathology of this part of the intestine. It is known that every year around the world, about a million new cases of colorectal (in the terminology of clinicians, recto-sigmoid) cancer are diagnosed. For example, in the United States, approximately 150,000 new cases of this disease are detected each year. So, according to the American cancer society, "recto-sigmoid cancer", ranks second among the causes of death - from malignant tumors. It accounts for 10 to 15% of deaths in malignant tumors. This pathology occurs in 1 in 18 people, and every year in the United States, 56,000 people die from cancer of this localization. Scientific information about the lymphoid structures of the recto-sigmoid part of the intestine, which, as is well known.^[14] perform pronounced functions of immune protection, is far from optimal and requires immediate implementation, which will contribute to the solution of many issues of proctology and other related areas.

The practical significance of the work is determined by obtaining new and fundamentally important information about the lymphoid structures of the recto-sigmoid part of the intestine in normal conditions. These materials can be used in the study of biopsies of the recto-sigmoid intestinal mucosa, autopsy material for various pathologies as quantitative and qualitative standards.

Knowledge of the morphological features of the lymphoid apparatus of the recto-sigmoid part of the intestine will contribute to a better understanding of the structure of the human immune system as a whole. In addition, these materials will provide a more adequate perception of the physiology of the final part of the colon, which is important, given the importance of these structures in the overall life of the body.

Critical morphofunctional shifts occur naturally in the immune system of children. These stages in the ontogenesis of the immune system coincide with the transition periods of the overall development of the child's body. The first immune crisis coincides with the newborn period, when the body first meets with a huge number of foreign antigens. Lymphoid tissue, the cells responsible for the mechanisms of non-specific reactivity, receive a significant stimulus for development in the first hours. Diverse microflora colonizes the gastrointestinal tract, respiratory tract, and skin. If a normal microflora is quickly formed, then the development of the immune system is correct. In the peripheral lymph nodes of the newborn, there is an increase in the concentration of plasma cells and lymphocytes, an increase in their mass and functional activity. On gnotobionts-animals raised in non-microbial conditions, it is shown that their lymphoid apparatus is insufficiently developed due to the lack of antigenic stimulation.

The immune system is phylogenetically related to the youngest formations and is very labile to external influences.^[18] Immunodeficiency occurs as a result of loss or failure of function of one or more elements of the immune system. Primary immunodeficiency States are caused by internal defects in the cells of the immune system and are mostly genetically determined. Secondary immunodeficiency occurs during a person's life under the influence of various adverse environmental factors.^[14]

The immune system of the gastrointestinal tract is most strongly developed. Along with the digestible food components and non – digested fiber components, many antigens-bacteria, viruses and food allergens-enter the digestive tract and serve as the first barrier to this flow. To protect against them, there is an immunocompetent lymphoid tissue in the gastrointestinal tract.^[19] to date, there is no doubt about the importance of the role played by the normal human microflora in its development, life and maintenance of health. The leading role in the functioning of both the systemic immunity and the immune system associated with the lymphoid tissue of the gastrointestinal tract is played by the intestinal microflora. The constant presence in the intestine of a sufficient number of attached to the wall of the resident microorganisms prevents the growth of pathogenic microorganisms, their invasion into enterocytes and passage through the intestinal wall by establishing in their habitat unfavorable for extraneous microflora pH, bacteriostatic formulation of low molecular weight metabolites of bacterial degradation of toxins, production of broad-spectrum antimicrobial substance family bactericidal.

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