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THE THYMUS GLAND IS THE CENTRAL ORGAN OF IMMUNITY AND BLOOD CIRCULATION

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Summary: In the last 20-25 years, there has been a very rapid development of immunology, the cellular and subcellular foundations of the immune response, the participation of the thymus in immunosuppression processes have been clarified. The thymus is the central organ of the immune system, where, under the action of hormones and biologically active substances, the number of which includes more than 30 names, the initial stages of T-lymphopoiesis are carried out, the formed pretimocytes and thymocytes migrate from the thymus to the peripheral organs of immunity and reach their maturity. At the same time, the structural and functional features of the thymus reaction during antigenic stimulation are still poorly understood. In this regard, the purpose of our study was to clarify the cellular and subcellular mechanisms of thymus involvement in immunogenesis in experimental salmonella infection.
Keywords: thymus, salmonella infection, immune system, immunology, antigenic stimulation.

Research materials and methods. The experiment used white mongrel male rats weighing 150-160 g, which were on a regular laboratory diet. The animals were divided into a control (30 rats) and an experimental (150) group, the model of salmonella infection was reproduced by flushing a daily agar culture of Salmonellae Tyrhimurium at a dose of 2 billion. microbial bodies . The animals were removed from the experiment by decapitation under ether anesthesia, 3, 6, 12, 24 hours and 3, 5, 7, 14 and 21 days after infection. The thymus was treated with light-optical and electron microscopic examination methods according to generally accepted methods.

The thymus is surrounded by a capsule of connective tissue, and the inner part of the capsule divides the glands into incomplete lobules, while the cortex and a lighter central zone can be distinguished on the lobules of the thymus. The specific staining of these zones is due to the density of lymphocytes or thymocytes. In the cortical zone, they are dense and fill the mesh cavity formed by reticuloepithelial cells. T-lymphoblasts and large cytoplasmic basophilic staining cells are located along the periphery of the cortex. In their nuclei, chromatin is less or more aggressive. These cells have the ability to multiply mitotically, due to which thymocytes are formed continuously. In this case, reticular epithelial cells are decomposed as “nest cells”, they create a microenvironment for developing T-lymphocytes.

The structural and functional changes of the thymus in the dynamics of experiments are adaptive in nature, the periods differ:

early changes – at first experiments up to 24 hours;
pronounced immunomorphological rearrangements - 3-14 days of research;
reconvalescence – 21 days of experiments

Each of these periods is characterized by a certain restructuring of the organ.

One of the characteristic signs of the early period of experiments are disorders of the microcirculatory bed of the thymus, manifested in the form of dilation of hemocapillaries, arterioles, postcapillaries, capillarostasis. Destructive changes in thymus cells are often found in the form of swelling and lysis - components of subcellular organelles, expansion of pericapillary spaces, etc.

The period of pronounced immunomorphological rearrangements is characterized by hypertrophy of thymus stroma and CMF cells, hyperplasia of thymocytes in almost all zones, activation of thymic lobule cells, increased proliferative activity of thymus cells.

The period of long-term results is characterized by a tendency to normalize qualitative and quantitative changes in the components of the thymus gland, a decrease in the proliferative activity of cells in them. However, the tension of the subcellular structures of immunocompetent cells still persists, there is an increase in the number and functional activity of stromal mechanocytes-fibroblasts, reticular epithelial cells.

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