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Morphological Changes of Lymph Nodes in Experimental Ulcerstic Colitis

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Relevance. Ulcerative colitis is a chronic inflammatory bowel disease of unknown etiology, a disease with multifactorial etiological components, manifested by damage to the large intestine and an inadequate immune response in individuals with a genetic predisposition. Lymph nodes are blood-forming organs and serve as a barrier to pathogenic microbes, their toxins and toxic substances in general. Lymph nodes are pink-gray, covered with a thick capsule, round or oval-shaped structures. They are also called lymphoid organs because of the formation of lymphocytes in them. Various pathologies cause morphological changes in lymph nodes.

Objective: To study morphological changes in lymph nodes after experimental ulcerative colitis in 6-month-old white outbred rats.

Materials and methods. The study used 30 rats, which were divided into control and experimental groups by age. The room where the rats were kept met the requirements for the conditions of keeping laboratory animals of this type (t 20-24 Co, humidity 60%, light/darkness 12 hours/12 hours). Water was provided without restrictions and when feeding the animals, all sexually mature rats were kept in quarantine for a week, after the exclusion of somatic or infectious diseases, they were transferred to a normal vivarium regime.

Before starting the experiment, the animals underwent a two-week quarantine and were trained to stay in the experimental chamber (requirements of the ethical committee and commission for the control and use of laboratory animals at the BGMI).

The first group of rats (intact) was the control group, and in order to compare the results with the other group, the white outbred rats were fed a simple standard diet.

In the second group of our experiment, the white outbred rats were injected rectally with 1 ml of 4% acetic acid through a special probe for 20 days to induce ulcerative colitis.

Hematoxylin-eosin staining is carried out in the following order:

The obtained section is placed in distilled water, the nucleus is stained with hematoxylin solution, the water pipe is washed in running water. Differentiated in 0.3% spirit acid solution. (i.e., excess colors are reduced.) Then washed in running water and after a while again washed in Scott's aqueous solution. Stained in Eosin solution for 2 minutes. At the final stage, dehydrated, cleaned and observed.

After the staining steps, we can see that the cellular components: collagen-white - pink, acidophilic cytoplasm - red, muscles - dark pink, basophilic cytoplasm - purple, erythrocytes - cherry red, nucleus - blue.

Results. When we examined the lymph nodes of 6-month-old white outbred rats in the control group under a microscope, we obtained the following results: the lymph nodes are covered with dense connective tissue consisting of elastic and collagen fibers and scattered fibroblasts. The outer convex surface of the lymph node is pierced by numerous afferent lymphatic vessels. The outer layer is the cortex. It consists of the subcapsular sinus, cortical sinus and lymphoid nodes. The subcapsular sinus is the cavity through which the lymphatic fluid from the afferent vessels first enters the lymph node. The lymph fluid then flows from here into the cortical sinuses, which are branches of the subcapsular sinuses. The cortical sinuses are also called trabecular sinuses because they run along the trabecular meshwork within the lymph node.

The cortical layer contains a large number of helper T lymphocytes and a collection of rapidly dividing B lymphocytes in the peripheral part of the lymph node.

The main functions of the lymphatic system are to maintain fluid balance, absorb fats, and protect the body. The lymphatic system is involved in intestinal inflammatory processes. Inflammatory reactions lead to increased lymph flow. Lymphangiotic processes resulting from lymphatic obstruction and contractile dysfunction are observed in IBD. Lymphatic obstruction, increased lymph flow, and neovascularization result in dilation of lymphatic vessels and submucosal edema.

Local inflammatory processes, including appendicitis, diverticulitis, cholecystitis, and pancreatitis, can cause mesenteric lymphadenopathy. Hematological malignancies, metastases of solid tumors, various infections, and systemic inflammatory diseases should also be considered in the differential diagnosis of mesenteric lymphadenopathy.

Conclusion

The following morphological changes were observed in lymph nodes after ulcerative colitis (UC):

Inflammation and enlargement of the lymph nodes, which indicates activation of the immune system in response to intestinal inflammation.

Follicular hyperplasia - An increase in the number of lymphoid follicles in the cortical zones of the lymph nodes and their activation is observed. This indicates an increased immune response. Accumulation of macrophages in the lymph nodes, which indicates an ongoing inflammatory process in the body.

Fibrosis and sclerosis - As a result of prolonged inflammation, part of the lymph nodes may fibrosed and change their structure.

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