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**PERIPHERAL BLOOD DYNAMICS  
IN INFLAMMATION AND SUBSTANCE P BLOCKADE**

Inflammation is a typical pathological process, which is the basis of most human diseases, an urgent problem of medicine [1]. It is a series of sequential intercellular interactions regulated by mediators - modulators of inflammation. Neuropeptides increase vascular permeability, increase the adhesion of neutrophils to the endothelium of the venules, increase the sensitivity of nociceptors, participate in the feeling creation of inflammatory pain [1]. Of considerable interest is the question of the role of tachykinins, namely substance P and neurokinins, in the pathogenesis of neurogenic inflammation, which has not been sufficiently studied [1, 2, 3]. Substance P, except for the nervous system, where it is present in the cerebral cortex, reticular formation, substantia nigra, cerebellum, hypothalamus, spinal cord, is contained in almost all body tissues as part of sensitive neurons, peripheral nerves, as well as in apudocytes [3]. The presence of substance P receptors on mast cells, polynuclear cells, macrophages and keratocytes has been proved [4]. It was found that neuropeptide receptors were found on cells of bone marrow origin, peripheral blood lymphocytes and monocytes [5]. Thus, the unsolved problem today is to determine the role of tachykinins in the reactions of the blood system in inflammatory conditions.

The **aim** of the study was to evaluate the peripheral blood dynamics in inflammation and substance P blockade.

**Material and methods.** An experimental prospective controlled randomized study was performed on 132 WAG rats. Stratification of animals in separate series was carried out in the amount of 6 individuals. A carrageenan model of inflammation was selected, using 10 mg of a-carrageenan (Sigma, USA) in 1 ml of saline [6], which was injected intramuscularly into the rat thigh under thiopental anesthesia. To inhibit the synthesis and effects of substance P NK-1R inhibitor aprepitant was used, which was administered intraperitoneally at a dose of 10 mg dissolved in 1 ml of isotonic sodium chloride solution, daily throughout the experiment [7]. In the dynamics of experimental inflammation studied the reactions of the blood system (leukocyte reaction of peripheral blood) in the natural course of carrageenan secondary and chronic substance P. Rats were kept in the vivarium for 10-12 individuals in a cage under standard conditions on a normal diet with free access to water. To exclude the influence of natural circadian rhythms on the indicators, the experiment was performed in the autumn-winter period in a standardized way in the morning. Rats in the control series remained intact for inflammation during the experiment or were only administered the drug and kept under constant standard conditions. Experimental rats of intervention series in accordance with the tasks were subject to modeling of inflammation and the use of a pharmacological drug - aprepitant, an inhibitor of NK-1 receptors. Non- parametric statistics was used with critical p 0.05.

**Results and discussion.** Inflammation on the background of blockade of neurokinin receptors of type 1 substance P at the 6th hour there is a significant reduction of total leukocyte count in 1.28 times (p<0.05), as well as on the 10th day a significant reduction in the number of stab neutrophiles in 4 times (p<0.05) and the number of eosinophils in 3 times (p <0.05).

Although in our study with blockade of substance P significantly the number of lymphocytes in the blood did not differ from the natural course of inflammation, there was a tendency to reduce their number after 6 hours and from 7 days to the end of the study compared to the same time of natural inflammation.

On the 28th day there was an increase in the number of monocytes in 2 times (p<0.01) compared with the same period of the natural course of inflammation.

A special criterion for the presence of the species, the course of inflammation, the effectiveness of anti-inflammatory drugs and appropriate therapy is the cellular dynamics of the inflammatory focus and the associated changes in the entire blood system. Studying the course of inflammation under conditions of blockade or stimulation of substance P and neurokinins, can provide integrative answers to questions about the role and receptor mechanisms of tachykin in the pathogenesis of inflammation. Under natural conditions of inflammation, substance P stimulates blood leukocytes and also prolongs the inflammatory response.

**Conclusions:**

1. The results of the study indicate that in natural conditions of inflammation, substance P stimulates blood leukocytes, as well as prolongs the inflammatory response. The blockage of Substance P helps to control an inflammation and make the peripheral blood system reactions less significant.

2. The perspective of further research is evaluation of the role of tachykinins in inflammatory blood system reactions.

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