

Морфофункціональна характеристика формених елементів крові та центрального лімфоїдного органу за умов короткочасного гіпотермічного впливу

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Morphofunctional Feature of the Formed Elements of Blood Cells and the Central Lymphoid Organ Under Conditions of Short- Term Hypothermic Exposure

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A comprehensive study of the morphofunctional features of the formed elements of the blood and the main lymphoid organs allows for a detailed analysis of the general condition and dynamics of the effectiveness of any experimental effect in trials. The time interval between blood collection and conducting research should be minimal, because after a long interval, the size of erythrocytes may increase (due to swelling), the sedimentation rate of erythrocytes may decrease, platelet aggregation may occur, and the nuclei of leukocytes may change, which leads to difficulties in their differentiation [Dudchenko 2019]. According to this, it became relevant to investigate the morphofunctional features of blood cells and the main lymphoid organs of male rats under conditions of short-term hypothermic exposure at a temperature of $(6 \pm 2)^\circ\text{C}$.

The work was performed on 6–7-month-old non-linear white male rats of the species *Rattus norvegicus* weighing 250–270 g ($n = 40$). All animals were divided into groups ($n = 20$ in each): 1 – intact (without exposure), which were immediately examined; 2 – after short-term hypothermic exposure for an hour at a temperature of $(6 \pm 2)^\circ\text{C}$. After the animals were sacrificed by displacement of the cervical vertebrae, they were decapitated and blood was obtained, which was then heparinized in a 0.2 mg/ml heparin solution (Spofa, Czech Republic). In heparinized blood samples, the number of erythrocytes, leukocytes and the leukocyte formula of blood, their viability, were determined according to generally accepted methods; phagocytic activity and oxygen-activating ability (nitro blue tetrazole test) of neutrophils according to our improved methods; histological examination of the thymus according to generally accepted methods.

During short-term hypothermic exposure for one hour at a temperature of $(6 \pm 2)^\circ\text{C}$, hematological parameters of blood: the number of erythrocytes and leukocytes, the leukocyte formula of blood did not undergo significant changes in comparison with the control group of animals. Under microscopic analysis, erythrocytes and all types of leukocytes of both groups had physiologically normal sizes, general shapes, color of cytoplasm and nucleus, granularity. Phagocytic activity of neutrophils: the phagocytic number and the phagocytic index are slightly reduced in the experimental group, but probably not variable. When analyzing the oxygen activating capacity, the indicators are practically the same in both groups. In the morphological analysis of the thymus: the cortex and medulla substance of the thymus has a physiologically normal structure, almost the same number, the cells in them have normal shapes, sizes and colors and correspond to physiological norms.

Short-term hypothermic exposure for an hour at a temperature of $(6 \pm 2)^\circ\text{C}$ does not affect the morphology of formed blood elements, the functional characteristics of neutrophils, and the morphological structure of the lymphoid organ – the thymus. Within an hour, during short-term hypothermic exposure, their morphofunctional feature is preserved within the limits of physiological norms.

Характеристика гепатопротекторної активності кріоекстракту плаценти при ураженнях печінки різної етіології

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Characterization of the Hepatoprotective Activity of Placenta Cryoextract in Liver Lesions of Various Etiologies

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Recently, the preparations obtained from biological tissues are increasingly being considered as hepatoprotective agents. The mechanism of action of organopreparations is complex and includes direct and indirect activating influence on regeneration processes. Activation of protein synthesis by drugs of biological therapy can be carried out due to the action of substances of a peptide or nucleic nature that are included in their composition.

The research aim was to characterize the hepatotropic effect of cryoextract of placenta (CEP) in experimental liver lesions.

Studies of the hepatotropic effect of CEP were carried out under prophylactic, curative and curative-prophylactic modes of use on models of tetrachloromethane, D-galactosamine and paracetamol liver lesions in rats.

It was established that the prophylactic five-day introduction of CEP led to the leveling of tetrachloromethane-induced activation of lipid peroxidation and signs of cytolysis syndrome – the content of reactants with iobarbituric acid in liver homogenates was lower ($p < 0.01$) by 35.6% compared to the indices of rats with simulated tetrachloromethane hepatitis without treatment. The level of alanine aminotransferases after administration of CEP decreased ($p < 0.001$) by 56.0%, the level of aspartate aminotransferases reduced ($p < 0.001$) by 48.6%, compared to the indices of rats treated with tetrachloromethane induced hepatitis without treatment. There was also a decrease ($p < 0.001$) in the level of total bilirubin by 33.9% and a reduction ($p < 0.001$) in the levels of direct and indirect bilirubin by 10.6 and 65.1%, respectively, relative to the indices of animals with experimental toxic hepatitis.

Against the background of the introduction of placenta cryoextract in experimental D-galactosamine-induced hepatitis, the level of reactants with thiobarbituric acid decreased ($p < 0.001$) by 43.8%, the level of alanine aminotransferases reduced ($p < 0.001$) by 2.4 times, and the level of aspartate aminotransferases decreased ($p < 0.001$) by 45.3%. The level of total protein increased ($p < 0.01$) by 17.4% and the level of total bilirubin diminished ($p < 0.001$) by 53.5% relative to the indices of untreated animals.

The use of CEP shows pronounced hepatoprotective activity against the background of paracetamol-induced hepatitis in rats. This was indicated by an increase ($p < 0.01$) in the value of the antioxidant-prooxidant index by 2.3 times, a decrease ($p < 0.001$) in the activity of alanine aminotransferases and aspartate aminotransferases by 44.0% and 29.6%, respectively, as well as a reduction ($p < 0.001$) of the level of direct bilirubin by 52.5% against the background of CEP administration relative to the parameters of rats without treatment.

The use of cryoextract of the placenta normalized metabolic processes in the liver and restored its functional state in models of tetrachloromethane, D-galactosamine and paracetamol lesions.

