Abstract: the article presents the results of the study of the intensity of the generation of reactive oxygen species in the mitochondrial fraction of hepatocytes in the early stages of cerebral ischemic stroke in the experiment. For this study, we used white rats of Wistar breed with a resemblance to the angioarchitectonics of the brain. Studies were conducted 1, 3 and 7 days after ischemia-reperfusion. Significant increases in the content of MDA and the content in the mitochondrial fraction of SMP, the decay products of protein molecules, generation of ROS were found.

Keywords: ischemia, reperfusion, ROS, mitochondrial fraction, antioxidant system, proliferative changes, MDA, SMP.

Relevance of the problem. Post-stroke disability ranks first among all possible causes of disability, only about 20% of people who have had a stroke return to their previous work, while one third of patients are people of socially active age, which emphasizes the relevance of the research [1, 2]. With the development of ischemia of brain tissues, metabolites of interaction of reactive oxygen species with macromolecules of protein and lipid nature accumulate [3]. The main objective of the elimination of cerebral tissue ischemia is the elimination of avalanche-like toxic products in the shortest possible time, in order to maximize the limitation of the penumbra zone, in order to avoid massive death of brain cells [4, 5].
Studies in recent years are mainly devoted to the death of nervous tissue in ischemia and due attention is not given to the functional state of the liver.

**Purpose of research.** The aim of this study was to study the intensity of the generation of reactive oxygen species in the mitochondrial fraction of hepatocytes in the early stages of cerebral ischemic stroke in the experiment.

**Materials and methods of research.** The experiment reproduced clipping of the carotid artery to create a mechanism of reperfusion damage to the brain. All treatments of the experiment were consistent with the requirements of the International rules of humane treatment of animals, as reflected in the Sanitary rules for equipment and maintenance of experimental biological clinics (vivariums). The choice of the object of the experiment was due to the similarity of brain angioarchitectonics of laboratory white Wistar rats and human, as well as the proximity of the main hemodynamic parameters.

Used animals weighing 150-180 grams at the age of 4-7 months were divided into 2 groups: the 1st group consisted of 8 rats, which produced a skin incision of the neck area over the carotid artery on one side (left), followed by suturing of the skin (falsely operated), the 2nd group consisted of 9 rats, which opened the left carotid artery, clipped for 20 minutes, followed by reperfusion and complete restoration of cerebral blood flow.

Studies were conducted 1, 3 and 7 days after ischemia-reperfusion. Verification of ischemic stroke was confirmed on the basis of viewing of light-optic preparations stained by using Nissl’s method. The homogenate obtained in the Potter homogenizer followed by differential centrifugation. In the resuspension of the mitochondrial fraction, the content of Malon dialdehyde (MDA) was determined by the method of Steel I. T. and co-author, the content of medium molecular peptides (SMP) by the method of Gabrielyan. The results were recalculated by the amount of total protein (Lowry H.).

**Results and discussion.** In the early stages of the study in the mitochondrial fraction of hepatocytes revealed a significant increase in MDA, exceeding the level of control 2.3 times. Apparently, this increase in MDA is associated with an increase in the amount of this product of the splitting of molecules of lipid nature washed out of brain tissues and / or the launch of an increase in reactive oxygen species (ROS) as a result of reperfusion. In subsequent study periods, the accumulation of MDA in the mitochondrial fraction of hepatocytes decreased and did not reach the level of control. In the early stages of experimental ischemic stroke in rats found focal proliferative changes within the lobules of the liver, clearly delimited infiltrates from the cells, which was, apparently, the trigger for the generation of ROS.

Along with the damage of lipid molecules, we found an increase in the content of the mitochondrial fraction of SMP, the decay products of protein molecules. The number of SMP was 2.1 - 3.2 times higher than the control level. In the subsequent terms of the study, the number of SMP decreased, but did not reach the level of control. The equilibrium state of ROS generation and the power of the antioxidant system determine the outcome of the pathological process.

**Conclusion.** In experimental ischemia of brain reperfusion, changes in hepatocytes are observed, accompanied by increased generation of ROS, accumulation of MDA and SMP.

**References / Список литературы**