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INTENSITY OF FREE-RADICAL PROCESSES IN RAT LIVER MITOCHONDRIA AT MODERATE HYPOTHERMIA OF VARIOUS DURATION

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Artificial moderate hypothermia is widely used in clinical practice to protect organs from the effects of ischemia/reperfusion, injury and hypoxia. However, a decrease in the body temperature of homoiothermal animals induces oxidative stress, the severity of which may depend on the time of exposure to the "cold" factor. Since mitochondria play a key role in the generation of ROS, we studied the dependence of the intensity of FRP in mitochondria of the liver of rats on the duration of moderate (30°C) hypothermia. It turned out that short-term (30 min) hypothermia activates the processes of LP, while the concentration of lipid hydroperoxides, SchB and MDA significantly increases. Prolonging hypothermia to 1 hour reduces the content of many LP products, and at 3-hour hypothermia their normalization is observed. Short-term hypothermia and its prolongation to 1 hour is accompanied by oxidative destruction of mitochondrial proteins, which is reflected in a decrease in the content of sulfhydryl groups in them and an increase of carbonyl groups. At the same time, 3-hour hypothermia contributes to the normalization

of the studied OMP markers. The dynamics of changes in the levels of sulfhydryl and carbonyl groups in mitochondrial matrix proteins is more pronounced in comparison with membrane proteins. The study of the spectral characteristics of membrane proteins of mitochondria showed a decrease in the intensity of their fluorescence in the initial stages of hypothermia. The main contribution to it is made by tryptophan residues localized at the periphery. The prolongation of hypothermia to 3 hours promote to restore the parameters of fluorescence to the level of control. The data obtained in the analysis of second derivatives of fluorescence spectra indicate certain changes in spatial configuration of membrane proteins.

Keywords: rats, hypothermia, liver, mitochondria, lipid peroxidation, oxidative modification of proteins