UDC 577.12: 636.028:612.12:591.543.42

The biochemical serum parameters of the rats under the artificial hipobiosis

S.D. Melnytchuk*, S.V. Khyzhnyak*, V.S. Morozova*, V.V. Boyko*,
L.V. Babych**, V.M. Voitsitsky*

[*1]National University of Life and Environmental Sciences of Ukraine

[**]Clinical Hospital "Feofaniya" of Ukrainian State Administration

The determining factor for the developing of the artificial hypobiosis state in animals is a combination of hypoxic and hypercapnic gas environments with a decrease in body temperature. The influence of these factors causes diverse reorganizations in organs and tissues, leading to activation of the adaptive capacity of the organism. Herewith at these conditions the organism resistance to various external influences of physical and chemical factors increases. The methods of the hypobiosis modeling opened up perspectives for its use in medicine and veterinary medicine, including treatment of different pathological states and diseases. It is possible to control the artificial hypobiosis state by the research of the blood serum biochemical parameters in animals that is the goal of this work.

The modeling of the hypobiosis state in rats was performed by the method of "closed vessel". Animals of the control group were decapitated in the state of normotermia (rectal temperature was 37^{o}C). Animals of the experimental groups were decapitated under the artificial hypobiosis state (rectal temperature was 17^{o}C) and at related terms after this state (after 2 and 24 h). The biochemical parameters were determined in the blood serum on the spectrophotometric analyzer «BS-3000 P» by the company «Sinnova» (China). Works were carried out in accordance with the ethical principles of the World Medical Association Declaration of Helsinki (2008).

By the result of the research of the metabolites and macronutrients content in serum under the artificial hypobiosis the rise of the glucose, urea and inorganic phosphorus level and the decrease of the uric acid content were found. Also, the redistribution of the lipoproteins content was determined. The decrease of the

activity of such enzymes like alanine aminotransferase, lactate dehydrogenase and cholinesterase was discovered, that was associated with the reduction of the metabolism intensity. Herewith the activity of the enzymes that characterize the structural and functional state of the hepatocytes (aspartate aminotransferase, gamma-glutamyl transpeptidase and alkaline phosphatase) doesn’t significantly change. Besides it, the increase of the creatine kinase activity was found, that can be connected with the thermogenesis under these conditions. The revealed changes partly restore in 2 hours and achieve control values in 24 hours after the cessation of the influence of the artificial hypobiosis factors.

The obtained results indicate the adaptive character of the organism reaction in response to the artificial hypobiosis factors influence.