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FEATURES OF THE TOXIC ACTION OF METHYL TERT-BUTYL ETHER ON CHANGES IN HEMATOLOGICAL PARAMETERS IN RATS UNDER CONDITIONS OF COLD STRESS

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The main harmful factor affecting professional activities of certain categories of workers is the simultaneous action of chemical substances and physical factors of the environment on the body, in particular the action of methyl tert-butyl ether (MTBE) in combination with low air temperature.

Methyl tert-butyl ether is widely used as a component of vehicle gasoline and serves as an oxygen-containing, high-octane component in the production of unleaded, environmentally-friendly gasoline. Introduction of MTBE improves the eco-friendly properties of the fuel. It reduces the content of toxic products in exhaust gases, increases the completion of combustion of hydrocarbons. On the other hand, the long-term application of MTBE in automotive gasoline has shown that it has a negative impact on human health. It has been experimentally established that the effect of MTBE on the body can lead to suppression of the central nervous system, damage to the kidneys, and liver. It is proved that the male reproductive system is greatly harmed under the influence of MTBE in production conditions.

The purpose of this study was to determine any toxic effects of MTBE on haematological parameters of rats that are exposed to cold temperature.

In the experiment, four groups of male rats WAG of 185-200 g, 6 rats in the group were used: 1st group - animals exposed to MTBE in combination with a lowered air temperature of 4 ± 2° C (frigid conditions), 2- and the group of animals was subjected to actions only at a lowered temperature of 4 ± 2C, thus controlled in relation to animals of the 1st group. The rats of the 3rd group were subjected to the MTBE under the conditions of room temperature (air temperature 25 ± 2C), the 4th group - animals of control at a temperature of 25 ± 2C. The studies were conducted with 30-fold administration of MTBE in the stomach at a dose of 1/10 LD50 (500 mg / kg body

weight). The rats of the studied groups were kept in two different thermal conditions for 4 hours a day, 5 times a week.

Hematologic parameters studied - level Hbzag. and HbO2, the content of pathogenic hemoglobin derivatives - MetHb and SfHb, estimated the number of erythrocytes, leukocytes, reticulocytes, the presence of degradation products of hemoglobin in the form of Heinz cells, leukocytic formula, and the change in blood coagulation time. The obtained data is processed by generally accepted methods of statistics (average, average error, probability criteria of Fisher-Student).

The results of the experimental study in regards of toxic effects of MTBE on hematological parameters indicate an increase in the toxicity due to MTBE under cold stress conditions compared with the effect of MTBE under conditions of optimal temperature. The increase in toxic effects was characterized by more pronounced changes in a number of hematological parameters, namely: an increase in the level of reticulocytes - 55,00 ± 5,98 0/00 (the effect of MTBE under frigid conditions), against 41,83 ± 1,45 0/00 (action MTBE in conditions of room temperature), (P <0.05), eosinophils - 7.83 ± 1.01% versus 4.50 ± 0.43%, (P <0.05), segmental leukocytes - 32.00 ± 1.57% versus 20.33 ± 1.94%, (P <0.05), decrease in the number of lymphocytes was 48, 50 ± 2.40 versus 64.67 ± 2.29%, (P <0.05) , an increase in the time of blood coagulation - 236 ± 14,18 s versus 119,17 ± 6,44 s, (P <0,05). One of the common (pathognomonic) indication of hematotoxic activity of MTBE, regardless of temperature conditions, is reticulocytosis. When comparing the results between the two control groups, no significant difference was detected throughout the experiment.

Therefore, the results of studying the toxic effect of MTBE on changes in hematological parameters in frigid temperature identify the development of pathognomonic shifts in experimental animals due to the effect of MTBE provided, concluding that there is a strengthening of the toxic effect under low-temperature conditions.