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THE HEMOLYTIC EFFECT OF OXIDATIVE STRESS CAUSED BY CHRONIC EXPOSURE TO LOW CONCENTRATIONS OF CADMIUM ON THE BODY

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Introduction. The relationship between the degree of erythrocytes acid hemolysis and the indicators of oxidative stress in the blood of 3-month-old rats, which were receiving Cd^{2+} in doses of 0.1 and 1 $\mu\text{g}/\text{kg}$ of body weight through the intragastric tube for 36 days daily, was studied.

Methods. Erythrocytes were obtained from rats' blood after animal decapitation under thiopental narcosis. Blood and 0.15 mol/l NaCl were mixed in ratio 0.02:1, with 5 μl of heparin (5000 U/ml) were added in advance. The mixture was washed 4 times by 3 min centrifugation at 3000 rpm in 10x volume of 0.15 mol/l NaCl at the room temperature. Leukocyte film and supernatant were eliminated by aspiration. 5 μl of obtained erythrocytes were resuspended in 1.0 ml of 0.15 mol/l NaCl and transferred into 1 cm cuvette. Acidic hemolysis of erythrocytes was used in the research. Hemolysis was induced by HCl with concentration in samples of erythrocytes suspension equal 0.002 n. Under such conditions the optical density of the samples in cuvette was 0.2. Curves of erythrocytes hemolysis were registered by samples' optical density changes, measured at the wavelength $\lambda = 670$ nm and continuous careful mixing. Registration of a signal was carried out with a frequency of 1 sec. The indicators of hemolysis were the time of structural rearrangement of the

erythrocyte membrane before the beginning of the process of their destruction (t) and the rate of its destruction (v).

Results and Discussion. It was found that on day 36 in the presence of Cd^{2+} the value of t significantly decreases, and v – increases in the organism of animals. This additional destabilizing effect of Cd^{2+} on the erythrocytes membranes is greater at a dose of 1, than 0.1 $\mu\text{g}/\text{kg}$ of the body weight. The indicators of oxidative stress were contents of 8-isoprostane, carbonylated proteins, and activity of SOD and CAT in the serum. Cd^{2+} induces the development of oxidative stress, as evidenced by an increase of the content of 8-isoprostane, the level of proteins carbonylation, a slight increase of CAT activity and a tendency to increase of SOD activity in serum on the 36th day. As in the case of hemolysis, the degree of expression of these effects is greater at a dose of 1, than 0.1 $\mu\text{g}/\text{kg}$ of body weight.

Between the numerical values of 8-isoprostane, carbonylated proteins and the activity of CAT, a negative correlation with t and a positive correlation with v were found.

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