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BIOCHEMICAL PARAMETERS OF BLOOD WITH INCREASING CONCENTRATION OF NITRIC OXIDE

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Introduction. The nitric oxide molecule is the regulator of necessary functions of the organism. It implements intercellular communication and regulation of important physiological functions such as neurotransmission, platelet aggregation, lipid peroxidation processes in the development of inflammatory processes. Information about the effect of NO on the oxidant/antioxidant systems is controversial, therefore this requires detailed study. The purpose of research is to estimate indicators of oxidative stress and markers of organ damage in the blood under conditions of excess of nitric oxide concentration.

Methods. The experiment was conducted on 18 white male rats, who weighed 200-230 g. Animals were randomly divided into three groups ($n = 6$). Rats of the control group were injected with 1 ml of 0.9% NaCl solution (group I). The increase of NO concentration was caused by a 6- and 12-day intraperitoneal injection of sodium nitroprusside (SNP) at a dose of 1.5 mg/kg (groups II and III). After completion of the simulation we subjected the animals to 18-hour food deprivation with free access to water then anesthetized the rats with a lethal dose of ketamine hydrochloride solution (220 mg/kg) and collected blood.

Results. We determine the intensity of lipid peroxidation processes by the concentration of the secondary lipoperoxidation product – malondialdehyde (MDA) in the serum (Volchegorsky et al., 2002). The content of circulating ceruloplasmin

was measured using the modified Revin method (Kamyshnikov, 2002). We studied fibrosis process by concentrations of protein-bound hydroxyproline (Osadchuk et al., 1987). Also we raised activity of pancreatic enzymes: α -amylase and trypsin (Kamyshnikov, 2002).

Discussion. The content of MDA in serum increases by 18% for 6 days and by 92% for 12 days of injected SNP that indicates the development of oxidative stress. At the same time the content of ceruloplasmin increases 1.76 and 1.94 times, that indicates the active work of the antioxidant system. Also, there was a decrease in the total protein content by 12% with a 12-day injection of SNP. The concentration of protein-bound hydroxyproline and activity of pancreatic enzymes increased unreliably.

Conclusion. Increased concentration of NO stimulates the formation of active forms of oxygen and free radicals. But at the same time it has a positive effect on the antioxidant system and activates the synthesis of enzymes that perform the protective function. Therefore internal organs do not undergo a critical effect of oxidative stress when NO synthesis is elevated to a certain extent.

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