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SYSTEMIC TOXICITY OF ACRYLAMIDE IN SWISS MICE

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We studied systemic influence of acrylamide toxicity on the antioxidative system of SWISS mice. The mice were injected with two doses of acrylamide 20 and 40 and 80 mg/kg b.w. The injections were made once a week for 8 weeks. Mice were decapitated after 12, 24, 48 hours and in one week periods between 1 st and 8 th week of the experiment. Next blood samples, brain hemispheres, cerebellum, brainstem, eye lenses, liver, kidneys, testes were taken. In blood serum the concentrations of glucose, cholesterol and triglyceride were measured. In the rest of samples the concentration of reduced glutathione, and activity of superoxide dismutase, glutathione peroxidase and catalase were estimated. In neural system activity of acetylcholinesterase was estimated additionally.

Systemic influence of acrylamide was generally related to significant depletion of reduced glutathione content in tested organs and significant changes in the concentration of glucose, cholesterol and triglyceride in blood serum. The decreases of reduced glutathione content were accompanied by affected activity of antioxidative enzymes. In the studied brain structures clear reduction of acetylcholinesterase activity occurred.

Our studies indicated that acrylamide toxicity is related to disturbances in redox balance and disturbances in basic blood parameters. The inhibition of acetylcholinesterase participates in neurotoxic properties of acrylamide.

Keywords:
acrylamide, antioxidants, glucose, triglycerides, cholesterol, acetylcholinesterase, mice organs