regulated in the icv-STZ blood, compared with control (more than 2-fold, $p < 0.05$). In the up-regulated genes, 23 biological processes were significantly overrepresented ($p < 0.05$) in the signature: cellular process, cell communication, developmental process, multicellular organismal process, single-multicellular organism process, system process, system development, cell adhesion, biological adhesion, response to stimulus, immune system process, neurological system process, nervous system development, mesoderm development, ectoderm development, localization, cell-cell signaling, transport, response to external stimulus, synaptic transmission, cell-cell adhesion, angiogenesis, reproduction. On the other hand, in the down-regulated genes, only translation was significantly overrepresented ($p < 0.01$). Our findings implicate the systemic nature of gene dysregulation in icv-STZ monkey.

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Non-Registered Abstracts

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INFLUENCE OF 3-METHYLXANTHINE DERIVATIVE ON THE MORPHOLOGICAL AND FUNCTIONAL CHARACTERISTICS OF NEURONS OF SENSORIMOTOR CORTEX OF RATS WITH EXPERIMENTAL INTRACEREBRAL HEMORRHAGE

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Abstract

The modern concept of neuroprotection during intracerebral hemorrhage includes sequential administration of primary and secondary neuroprotectors. In the article are represented results of in-depth study of a novel xanthine derivative – hydrazide of 1,3-dimethyl-8-N-benzylaminoxanthinyl-7-acetic acid (compound C-3), which previously showed high neuroprotective, antioxidant and energotropic activity.

The aim of the research was to study the effect of compound C-3 on morphofunctional parameters of neurons of the sensorimotor cortex of rats with experimental intracerebral hemorrhage.

We studied effect of compound C-3 on such morphofunctional parameters of neurons of IV-V layers of the sensorimotor cortex of rats with experimental intracerebral hemorrhage - neuronal density (number of cells per 1 mm^2 area of slice of cerebral cortex), the cellular content in the IV-V layers of the cortex in percentage; area of bodies of neurons (mm^2), RNA content in neurons.

Intracerebral hemorrhage was modeled in albino rats of both sexes weighing 140–160 g (90 animals) by injection into the region of the internal capsule and striatopallidal cores of the brain autologous blood, which was taken from the tail vein. Compound C-3 was injected at a dose of 100 mg/kg/day intragastrically as a suspension stabilized by Tween-80 during 4 or 18 days. As reference drugs were used mexidol and piracetam at doses of 100 mg/kg and 500 mg/kg, respectively.

It was shown that the course administration of hydrazide 1,3-dimethyl-8-N-benzylaminoxanthinyl-7-acetic acid (C-3) at dose 100 mg/kg intragastrically to rats with experimental intracerebral hemorrhage caused a significant neuroprotective effect. Neuroprotective action of compound C-3 was implemented in the acute period of experimental pathology and manifested in a positive influence on the morphological and functional parameters of neurons of IV-V layers of the sensorimotor cortex. a significant increase in neuronal density and an increase in RNA content in the neurons of both the 4th (the most pronounced effect) and on the 18th day after intracerebral hemorrhage. This fact indicates that the injection of the C-3 reduced neuronal damage and improved the processes of transcription and translation in the cells. The level of influence on the morphological and functional parameters of neurons in experimental intracerebral hemorrhage of novel xanthine derivative C-3 significantly superior on the 4th day of the experiment piracetam and mexidol, and on the 18th day - piracetam.

Thus, the neuroprotective effect of compound C-3, in contrast to the reference drugs, realized in the acute phase of experimental pathology and had a positive effect on the functional activity of neurons.