Features in afterischemic activity of IL-1Ra and IL-2 in experimental hemorrhagic stroke

Suprun E., Suprun A.
Department of general Pharmacy and Safety of drags
National University of Pharmacy,
Kharkov, Ukraine
elinasuprun202@gmail.com

The search for new drugs for correction of hemorrhagic stroke is still actual. Ischemic damage of brain tissue leads to the formation of energetic deficit, development of glutamate-calcium and cytokine cascade. Increases production of proinflammatory interleukin-1 (IL-1) that causes activation of local inflammatory activity and neuronal death. In response on expression of IL–1 its receptor antagonist is secreted (that leads to blocking the effects of IL-1) and then IL–2. The purpose of work was studying of effect of cytokine drugs (IL-1Ra and IL–2) on the dynamics of index of carbohydrate-energetic balance, oxidant stress, expression of genes of the early reaction and the intensity of postinsult neurological and cognitive disorder in experimental hemorrhagic stroke (administration of autoblood in internal capsule of brain in rats) in administration in dose of IL-1Ra 7,5 mg/kg and of IL–2 0,01 mg/kg during 18 days.

Material and methods: In homogenate of brain in acute period of stroke and in the phase of restoration (4 and 18 days) using the biochemical methods the ATP, ADP, AMP, the content of products of oxidative modification of protein (AFG and KFG), peroxidation of lipids (DK, TK, MDA). Antioxidant protection was evaluated by the activity in brain tissue SOD, catalase, glutathionperoxidase. Expression of c-Fos protein in sensor-motor zone of cortex was founded by the indirect immunofluorescence. Using the standard methods oriental-studying habits, neurological deficit (by scale of Stroke – index McGrow), the conditioned reflex of passive avoidance. Results of our experiment proves that in rats experimental hemorrhagic stroke was accompanied with typical pathophysiological indication – formation of mitochondrial dysfunction with following energetic deficit, activation of nitrogen oxide system and formation of free-radical process of damages of proteins and lipids on the background of apoptosis activity processes leads to suppression.

We set that administration of IL-1Ra (mostly) and IL–2 optimizes all indexes – decreases degree of oppression of oxidative processes in Kreb's cycle, increases the intracellular stock of ATP, stabilizes the activity of pro- and antioxidant results when the synthesis of c-Fos protein was inducted, activation of apoptosis, improves the index of movement activity, psychoneurological status using the McGrow's Stroke-index and the procreation of reflex of passive avoidance. Effects more expressed in recovery period that testifies the necessity of application of cytokine drugs as cerebroprotective in hemorrhagic stroke. On the studied model experimental hemorrhagic stroke activity of IL-1Ra and IL–2 to prevent neurological complication more that in Thiocetam.

Conclusion: Cytokine drugs recombinant IL-1Ra and IL-2 can be used as effective chain in complex therapy of afterischemic state, also for effective protection of brain tissue in hemorrhagic stroke.