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Protective properties of Histochrome in experimental stroke brain models

The problems of pathology of cerebral vessels in patients are the most socially significant. Cerebral changes are characterized by a high percentage of mortality among patients. Disability, rehabilitation after stroke, for example, leads to greater economic costs. Moreover, diseases of the blood vessels of the brain become more common among the young working-age people. Therefore, the search for new drugs and approaches to the treatment of these diseases is of great importance.

For many years, biological and pharmacological properties of Histochrome as cardiac drug have been studying at G.B. Elyakov PIBOC FEB RAS. In this study we have expanded the range of Histochrome effect on cerebrovascular diseases. Two independent experimental models of stroke (hemorrhagic and ischemic) were taken to study the effect of Histochrome on brain changes. The model of hemorrhagic stroke was induced by brain cell injury in the rats. The ischemia of focal blood rat brain circulation was induced by permanent occlusion of middle cerebral artery.

Using the hemorrhage model, we have found that the disturbances of microcirculation, ischemic changes in neurons, and neutrophil infiltration in the surrounding hematoma tissue decreased under the therapy with Histochrome. A positive effect was observed after injection of Histochrome within 1 hour after the onset of the induction of pathology. The infiltration of neutrophils began 12-24 hours after the ischemia. We postulate that these changes together with edema and oxidative stress are potential targets for the treatment using the compound studied.

In a case of applied ischemic model we have shown that Histochrome reduces the risk of thrombosis in small-small arterioles. The area of ischemia in the bleeding tissue after occlusion is not growing in comparison with the control. This effect was verified by the method of Magnetic Resonance angiography.

The advantage of MR Imaging and Angiography are in performing the complete cycle of monitoring of the functional and morphological changes of the body animals from the norm to pathology and to the final reaction of the pharmacological effects of the studied compounds.

The study was carrying out on the equipment of the Collective Usage Center of PIBOC FEB RAS, "Far East center of noninvasive radio-frequency diagnostics of biological objects" (FECNRFD).

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