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Digoxine influence on the oxidative-nitrosative cascade development on the model of rat focal cerebral ischemia

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Introduction: Digoxine can provide important ATP-preserving effect through Na+/K+-ATPase inhibition but nowadays haven't been used for the neuroprotective purpose and its local and systemic influence on the oxidative-nitrosative cascade development hasn't been studied.

Methods: The study involved 15 Wistar male rats. Animals were divided into 3 groups with 5 rats in each. Temporary stroke was induced by occlusion of the right internal cerebral artery. I group included 5 untreated rats with focal brain ischemia, ii group – 5 rats with focal brain ischemia treated with digoxine (0.75 mg/kg), control group – 5 intact rats. At 48h after the focal ischemia blood and brain tissue samples were obtained. Neurological status, parameters of prooxidant-antioxidant metabolism and No metabolites were estimated in brain tissue homogenate, erythrocyte hemolysate and blood plasma.

Results: In i group activities of lipid peroxidation were higher in the comparison with the treated rats as well as glutathione cycle enzymes activity and GSH content reduced. The highest concentration NOx-compounds and NOS activity were estimated in untreated animals, whereas L-arginine concentration was reduced in plasma and increased in erythrocyte hemolysate in the comparison with the treated and intact rats.

Conclusion: Administration of digoxine at the early onset of the animal model of ischemic stroke has inhibitive influence on the prooxidative cascade development and No hyperproduction at both local and systemic levels. Consequently, ATP-preserving effect of Na+/K+-ATPase blocking can be a useful target for the therapeutic inhibition ischemic cascade damage of brain tissue, which probably can prolong cell surviving time period before the revascularisation and reduce reperfusion oxidative damage.

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Dynamics of changes of intrahemispheric EEG coherence in patients after carotid transient ischemic attack

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Introduction: Coherence analysis of the EEG is a useful indicator of functional connections between different cortical areas. Reduced intrahemispheric coherence has been reported in patients with different disorders of central nervous system (CNS).

Work objectives: To determine the dynamics of changes of intrahemispheric EEG coherence in patients after carotid transient ischemic attacks (TIA).

Sources and methods: 18 patients aged 49-66 were examined by coherence analysis of the EEG on the 2-4th day and on the 10-14th day after TIA in region supplied by the left carotid artery. Control group included 24 age-matched practically healthy volunteers.

Results and conclusions: An absence of changes or increase of EEG coherence between some of cortical areas in the delta-band and a decrease of EEG coherence between cortical areas located at some distance from each other in the theta-band were revealed on the 2-4th day after TIA. A decrease of EEG coherence in the alpha-band was observed mostly between occipital areas and other cortical areas with the absence of signs attributed to focal cerebral lesions. A decrease of EEG coherence in the beta-1-band was less severe than that of alpha-activity. Changes of EEG coherence had contradictory character in the beta-2-band. Changes of EEG coherence in the majority of frequency bands were more severe at the affected side. Positive changes of EEG coherence in the majority of frequency bands were revealed on the 10-14th day after TIA. Estimated changes of intrahemispheric EEG coherence gave evidence of a reversible and functional CNS damage in patients after carotid TIA.