

Vascular dementia on the model of chronic cerebral hypoperfusion in rats. Two problems and possible ways to prevent them



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Biography

Zakharova E.I. has completed his/her PhD at the age of 37 years from Institute of Brain, Russia. She is the Leading Researcher of Institute of General Pathology and Pathophysiology, Russia. She has 44 publications that have been cited over 120 times, and her publication H-index is 8 and has been serving as a reviewer in some reputed Journals.



Abstract

Delayed cognitive dysfunctions in conditions of reduced blood supply to the brain are an actual problem. Modeling this pathology in rats by chronic bilateral occlusion of the carotid arteries (model 2VO), at a critical period of learning and memory impairment (7-10 days of cerebral hypoperfusion), we found another problem, namely the complete disappearance of the dopaminergic links, as well as the reduction and reorganization of the cholinergic links with these functions. Cognitive abilities ("rapid one-trial", short-term and long-term memory) began to be tested 7-9 days after occlusion on the model of spatial contextual learning in the Morris water maze. Two days after training, rats were taken into an acute biochemical experiment. The dopaminergic and cholinergic systems were evaluated by the activity of enzymes of tyrosine hydroxylase and cholinacetyl transferase, the markers of corresponding mediator systems, in sub-fractions of synaptic membranes and synaptoplasm isolated from cortical and hippocampal fractions of synaptosomes. We hypothesized that the reduction and reorganization of key mediator systems in the learning mechanisms develops over time and can underlie vascular dementia. In this case, the directions in the search for the prevention and correction of cognitive impairment can be as the action on key mediator systems at critical early stages of hypoperfusion. On 2VO rats, we tested two methods of subchronic (threefold) intraperitoneal administration of low doses of methyllycaconitine (MLA, a selective antagonist of nicotinic receptors of $\alpha 7$ subtype involved in spatial contextual learning), with the first injection after 2-3 hours (the acute postsurgical period) or 1 day after occlusion. MLA corrected impaired cognitive functions with any method of administration. Importantly that also with any method of administration, MLA contributed to the survival of 2VO rats, reducing their death in long-term hypoperfusion (10 days or more). The results of study indicate the promising of direction of our search.

Publication

1. Severe Hypokalemia Due to Excessive Coca-Cola Consumption, Presenting with Tetraparesis, Rhabdomyolysis, Atrial Fibrillation and Hypokalemic Nephropathy – Case Report
2. The prognostic value of late kidney transplant rejection pathology characteristics.
3. Paraproteinemia and Kidneys – from Henry Bence Jones till Now Days
4. Sarcoidosis with Combined Kidney Damage - Kidney Stones, Granulomatous Interstitial Nephritis and Acute Kidney Injury (case report)
5. Chronic Antibody Mediated Rejection of Renal Allograft – Efficacy of Combined Treatment with Plasma Exchanges, Intravenous Immunoglobulin and Rituximab (One Center Experience)

[13th International Conference on Vascular Dementia and Dementia](#) | Paris, France | February 19-20, 2020

Citation: Zakharova E I, *Vascular dementia on the model of chronic cerebral hypoperfusion in rats. Two problems and possible ways to prevent them*, Vascular Dementia 2020, 13th International Conference on Vascular Dementia and Dementia, Paris, France, February 19-20, 2020, 05