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MORPHOFUNCTIONAL CHARACTERISTICS OF MAGNOCELLULAR NUCLEI OF HYPOTHALAMUS IN SPONTANEOUSLY HYPERTENSIVE RATS

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Hypothalamus, particularly its paraventricular (PVN) and supraoptic (SON) nuclei, considered as a key element in the central mechanisms of blood pressure regulation. SON mostly involved in blood volume regulation, whereas PVN influences the lower cardiovascular centers in brain stem and spinal cord. We believe that it's necessary to study deeply the particular roles of these nuclei and their neuropeptides in hypertension pathogenesis.

The aim was to evaluate the morphodensitometric characteristics of magnocellular neurons of SON and PVN and to study in them the features of the vasopressin and opioid neuropeptides (μ-agonists) expression in spontaneously hypertensive rats (SHR).

Study was carried out on 10 male Wistar rats (mean blood pressure 83,8±0,64 mm Hg) and 10 male SHR (mean blood pressure 126,03±0,77 mm Hg) in age of 7-8 month and weight of 220-290 gram. We performed morphodensitometric and immunofluorescence assays (vasopressin, beta-endorphin, leu/met-enkephalines) in paraffin-embedded sections of hypocampus. The image analysis was done with ImageJ. Statistical analysis was performed using Kruskal-Wallis r test with post hoc Dunn correction. Significant difference was considered if $p<0,05$

In SHR, the hypertension development was accompanied by significant decrease of the nucleic acids contain in neuronal nucleus (PVN -29,9%; SON -38,9%) and its significant increase in nucleoli (PVN +76,8%; SON +58,1%). Moreover, we found the significant increase of nucleolus area (PVN +80,8%, SON +67,7%) and significant decrease of nucleus area (PVN -14,8%, SON -12,6%). We believe this data evidence in favor of the increase of functional activity of neurons. Additionally, we found the significant increase of cytoplasm area in SON neurons, which we currently cannot explain. In PVN of SHR, the immunofluorescence assay showed the significant decrease of the immunoreactive material (IRM) concentration and specific area both to vasopressin (-16,6% and -52,4%, respectively) and leu/met-enkephalins (-6,8% and -32,8%, respectively). We believe the decrease of listed neuropeptides evidence the exhaustion of compensatory mechanism in response of long-term hypertension. In SON figures, we found the significant difference only in the specific area to opioids (beta-endorphin -25,3% and leu/met-enkephalins -19,7%).

Changes in PVN evidence the involvement of this structure in spontaneous hypertension development in rats, in contrast of SON. This is consistent with our data obtained earlier.

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THE STUDY OF THE INFLUENCE OF MEDICAL-METEOROLOGICAL SITUATION ON THE NECESSITY FOR EMERGENCY MEDICAL CARE IN CHERNIVTSI

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Numerous clinical observations, experience of scientists in the different countries showed significant interrelation between the emergence and exacerbation of a number of pathological conditions and the changes of atmospheric processes. Pathogenic weather situation, especially hypoxic weather, leads to formation of meteotropic reactions which, in turn, contribute to exacerbations of broncho-obstructive diseases: chronic obstructive pulmonary disease (COPD) and asthma. These data confirmed by results of long-term research about the increased frequency of calls for specialized ambulance crews on this disease on days with biotropic types of weather, especially the hypoxic weather.

The existence and nature of dependency between the number of calls for emergency medical assistance for patients with broncho-obstructive diseases and the complex of meteorological factors, effecting on relative content of oxygen in atmosphere, in spring and autumn months in 2014-2016 in Chernivtsi were studied by retrospective analysis of data of archives of meteorological parameters and accounting reports of Chernivtsi Regional Disaster Medicine and Emergency Situations Center about visits of ambulance crews according to diagnoses.

The study found that the dependence of number of requests for emergency medical care on the type of medical-meteorological situation is complex and multifactorial. It found the prevalence of hypoxic type of medical meteorological situation in the days with meteo-pathogenic types of weather, and high number of requests for emergency medical help for patients with obstructive diseases of the respiratory system. The dependence of the number of requests for emergency medical care for patients with obstructive diseases of the respiratory system on a weather with low relative content of oxygen in atmosphere manifests a direct immediate nature, as well as reveals a belated reaction depending on the age of patients and accompanying complex of meteorological factors.