The experiment was carried out on nonlinear laboratory male rats at the age of the age of 1 month (young animals), 5 month (adult animals), 18 month (old animals). Non-enzymatic, enzymatic and total fibrinolytic activity was measured in rats with experimental diabetes. Proteolytic activity in homogenates of the brain structures was measured according to the intensity of stainin gafter the reaction with a zoalbumin, a zocasein and a zocol. The content of nitrates and nitrites (NOx) was measured by means of Griss's reagent in the blood plasma.

The constitutional proteolytic activity in accordance with lysis of high molecular weight proteins turned to be reduced in the area of hippocampus CA_2 and had the lowest valuesin the oldest rats. The similar age peculiarities of proteolytic activity status were foundin the hippocampus areas according to the lysis of low molecular weight proteins in the area of hippocampus CA_1 and collagen in the area CA_3. Age differences of the total and enzymatic fibrinolytic activity reduction were pronounced in the hippocampus CA_1 and CA_2 of old rats. There were no reliable changes found in the area CA_3. The constitutional changes of proteolytic and fibrinolytic activity correlated with changes in metabolites content of NO in the blood plasma of rats from different age groups, and in rats from the oldest age group respectively these values were 2,7 times higher in comparison with the younger ones and 1,3 times lower than in adult ones. Diabetes mellitus striggered a reliable increase of NO level as much as twice in adult rats and causedreduction of this valueby 1,5times.

The study found individual differences between the parameters of histological proteolysis and fibrinolysis in different areas of hippocampus of young adult and old rats. This condition is indicative of age dependence of decrease in activity and enzymes amount, which against additional pathological process can become a reason of accelerated of brain aging and development of neural degeneration in the brains structures.

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SEX-RELATED EFFECT OF HYPOBARIC HYPOXIA ON PROTEOLYSIS IN ADRENAL GLANDS OF IMMATURE RATS ACCORDING TO ALTERED PHOTOPERIOD DURATION

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Hypoxia is one of the conditions of usual mode in mammal's life. A peculiar feature of the systemic adaptation to hypoxia is a lot of polyorganic, morpho-functional disturbances, formed with participation of the neuro-endocrine system, the manifestations of which depend on the age, sex and the presence of influence of other environmental factors. Structural-functional change of the adrenal glands is a typical manifestation of organs reaction to the hypobaric hypoxia, varying correspondingly to age, sex, and functional activity of other endocrine glands. Melatonin is the main hormone of the pineal gland of the brain, which not only synchronizes the rhythms of peripheral tissues but also has anti-stress and antioxidant defenses, and promotes the body to adapt to dangerous effects of the environment, including hypoxia. Changing the intensity of proteolytic activity in peripheral tissues in the process of reaction to a variety of environmental factors may occur both as manifestation of regenerative processes, and as their involvement in the mechanisms of apoptosis.

The objective of the research was to study specific characteristics of sex-related changes of proteolytic activity in tissues of the adrenal glands of immature rats under ordinary conditions of keeping and hypoxic conditioning by systemic intermittent hypobaric hypoxia of changes, caused by constant lighting.

The experiments were carried out on 58 immature laboratoty albino male and female rats. Proteolytic activity was determined according to azoalbumin (LMWP-lysis), azocasein (HMWP-lysis) and azocol (collagen-lysis). The designed model of intermittent hypobaric hypoxia (equivalent to 4000 m above sea level, 2 hours daily for 14 days) combined with a varying duration of the photoperiod (natural duration of photoperiod and constant lighting) causes different changes of the proteolytic activity in the tissues of the adrenal glands of male and female immature rats with varying intensity, depending on the sex of animals and on the duration of photoperiod.

Simultaneous action of hypobaric hypoxia and constant lighting led to increase of proteolysis indices concerning all kinds of protein molecules: LMWP lysis increased by 25% in female and by 37,8 % in male, lysis of HMWP increased by 28% in female and by 60,5 % in male, as comparing to the control one. Accordingly, simultaneous action of hypobaric hypoxia permanent lighting causes in the most of all experimental groups increase of proteolysis intensity, concerning macromolecular proteins in particular. At the same time, lysis of collagen remained insignificantly higher in comparison with the control one and substantive hypoxia. Detected peculiarities of the reaction of the tissue proteolytic indices in the adrenal glands in immature rats to the applied factors and their combinations are indicative of sex related dependence of the sensitivity of the immature rats to a separated action of medium non-damaging intensity of environmental factors and different intensity of the process of adaptation under various conditions, and equalization of reaction of both male and female immature animals to simultaneous action of influences.

Modeling of the decreased melatonin-producing function of the pineal gland by application of constant lighting resulted in significant increase of the activity of proteolytic processes in the tissues of the adrenal glands in both male and female immature rats, that may testify to intensification of elimination of oxidation-modified protein molecules, formed by reducing of tissue antioxidant capacity according to melatonin deficiency. Sex-related differences in response of indicators of proteolysis condition in the adrenal gland as the main organ of adaptation process in immature animals are indicative of genetic-dependent peculiarities of reactivity of the body response mechanisms due to the action of environmental factors to their isolated and combined impact.