

regulatory organs of adaptive process are a typical manifestation of organic reaction to hypobaric hypoxia. A moderate intermittent hypoxia is used for altitude training to develop adaptation at both the systemic and cellular level.

The nature of proteolytic activity in peripheral tissues changes in the process of response to a variety of environmental factors that may be both a manifestation of regenerative processes, and their involvement in the mechanisms of apoptosis, in particular, due to oxidative modification of proteins.

Aim of research is to investigate sex-related dependence of the reaction of protein metabolism in tissues of the adrenal glands of immature albino rats under conditions of systemic intermittent hypobaric hypoxia and altered photoperiod. Experiments were carried out on 56 male and 60 female immature laboratory rats aged 1 month. Hypobaric hypoxia, equivalent to an altitude of 4000 m above sea level, was used for 2 hours, for 14 days in the background of three lighting modes: natural lighting, constant round-the-clock lighting and constant round-the-clock darkness. Proteolytic activity was determined according to azoalbumin, azokazein and azokol lysis as indices of low molecular weight protein lysis, high molecular weight protein lysis and collagen lysis. The degree of oxidative modification of proteins in the adrenal glands was assessed by the amount of 2,4-dinitrophenylhydrazone of neutral and alkaline nature.

A sex dependent difference in the activity of proteolytic processes and intensity of protein peroxidation in the adrenal glands in immature rats was found. In intact male rats intensity of proteolysis is significantly lower than in female rats. Modeling of a 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 be indicative of intensification in elimination of oxidation-modified protein molecules, formed by reducing of tissues antioxidant capacity according to melatonin deficiency. Simultaneous action of hypobaric hypoxia and permanent lighting caused the utmost increase of intensity of proteolysis in the experimental groups, particularly in regard to macromolecular proteins. Simultaneous action of hypobaric hypoxia and permanent darkness caused a reverse response, which was manifested in normalization of proteolysis indices, decreased by hypoxia. These results can be indicative of the fact that constitutional sexual differences are pronounced more in case of an isolated action of the applied factors, while in case of considerable exertion of adaptive mechanisms in combination of hypoxia with pineal gland dysfunction such kinds of differences are leveled.

The sex related dependence of response mechanisms of proteolytic processes in their interaction with the processes of peroxidation of proteins and their role in adaptive restructuring of the adrenal glands tissues under conditions of hypoxic preconditioning of the damaging effects of the modified duration of photoperiod by using of moderate hypobaric hypoxia require further investigation and comprehensive analysis.

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