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POTENTIATION OF NEUROPROTECTIVE ANTIHYPOXIC EFFECTS OF MELATONIN WHILE ADMINISTERING AN INHIBITOR OF NEURONAL REUPTAKE OF ADENOSINE

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Our previous studies demonstrated neuroprotective and antihypoxic action of melatonin in acute hypobaric hypoxia. According to literature, a neurotransmitter adenosine also shows antihypoxic effects. In this regard, the objective of the study was to clarify a neuroprotective influence of melatonin and dipyridamole (an inhibitor of neuronal reuptake of adenosine) at their simultaneous administration in acute critical hypobaric hypoxia. The study was conducted on nonpubertal (aged 5-6 weeks) outbred male white rats weighing 65-75 grams, pre-selected for medium resistance to hypoxia. Acute hypoxia was simulated by "lifting" the animals to the "height" of 12,000 m. The rats were kept on the "high-altitude plateau" to the reverse respiratory standstill, then a "descent" to the previous zero height was done. Melatonin and dipyridamole were administered intraperitoneally at doses of 1 and 5 mg per 1 kg of body weight respectively 30 minutes before hypoxia was simulated. Neuroprotective effects of melatonin and dipyridamole in acute hypoxia were evaluated by the indices of intensity of lipid and protein peroxidation, as well as by the activity of enzyme marker of neuronal plasma membranes (Na+, K+-ATPhase) in the brain of rats. It was established that the use of dipyridamole against a background of melatonin administration in acute hypoxia potentiates antioxidant effects of melatonin for the formation of products of lipid peroxidation (malondialdehyde) and of protein peroxidation (especially basic character products).