

THE ASSESSMENT OF OXIDATIVE METABOLISM OF BLOOD UNDER THE INFLUENCE OF ELECTROMAGNETIC RADIATION OF EXTREMELY HIGH FREQUENCIES IN THE EXPERIMENT

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Background: The wide use of low-intensity electromagnetic radiation (EMR) extremely high frequency (EHF) band (30-300 GHz) millimeter wavelengths (MMW) in the process of medical rehabilitation dictates the continuation of experimental studies related to effects on the organism various frequency-energy parameters in the system *in vivo*. Despite finding a reduction in the concentration of peroxidation products in the blood during EHF-influence, is still not formed a definitive view of the physical-chemical aspects of the mechanism of action of EMR EHF.

Aim of the study: To study the influence of the noise EMR of extremely high frequencies on the level of activity of pro- and antioxidant systems in a model of skin flap ischemia *in vivo*.

Materials and methods: In work rats of Wistar line were used. Animals were subjected to surgical intervention by cutting out the dorsal skin flap with axial type of blood circulation. In the postoperative period was carried out once daily irradiation of the occipital region in the area of the projection of the center of vegetative regulation of animals of electromagnetic radiation of extremely high frequencies 53,57-78,33 GHz with a dose of 1.2 mJ for seven days. The options indicators pro- and antioxidant protection were researched in blood.

Results: In erythrocytes of animals the concentration of malonic dialdehyde after surgery without irradiation has increased by 20% compared with intact animals ($p=0,050$). The decrease in the activity of the enzyme of the first line of antioxidant protection – superoxide dismutase by 16% ($p=0.003$) after surgery compared with the healthy group was revealed. This indicates insufficient compensation of free radical oxidation antioxidant system in operated animals. According to the data of induced biochemiluminescence and estimate of the activity of malonic dialdehyde it was shown that course irradiation contributes to the decrease in the intensity of lipid peroxidation. The concentration of malonic dialdehyde decreased to 34% under the influence of EMR EHF. Parallel it was marked the increase of the total antioxidant reserves of blood and the activity of enzymes of bioradical protection under irradiation.

Conclusion: The data obtained suggest that electromagnetic radiation of extremely high frequencies has a regulatory impact on the state of pro- and antioxidant systems of the organism,

which can be used in the correction of postoperative ischemic disorders and the restoration of disturbed homeostasis.