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Title

Comparative effectiveness of preventive effects of the waves of terahertz frequency band of nitric oxide on the rheological properties of blood in albino rats under acute stress

Source

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Abstract

Study of the whole blood of 75 white male rats and 150 female rats weighing 180-220 g is conducted. As the model simulating violation of microcirculation, the immobilization stress is used: rigid fixation of the rats on their backs for 3 hours. Once daily preventive exposure of the animals, prior to immobilisation, was carried out with the small-sized generator UHF-NO-Orbit at the frequencies MSIP nitric oxide 150.176-150.664 GHz. The study is conducted on 15 groups of white male rats and female rats, each of which has 15 individuals. Rheological properties of the whole blood was studied in samples of the volume of 0.85 ml with the rotary viscosimeter AKR-2. The viscosity of whole blood at the shear rates of 300, 200, 150, 100, 50, 20, 1, 10 s<sup>-1</sup>, 5 s<sup>-1</sup> is determined. Based on these data, the indices of aggregation (IAE), and erythrocyte deformability (EDI) are determined. The results of the studies show that 3-hour immobilisation leads to severe stress reactions manifested as a change in animal behaviour (aggression, response to weak stimuli), as well as indicators of blood rheology an increase in whole blood viscosity at all shear rates, increased erythrocyte aggregation and deformability in comparison to those of control group animals. It is shown that a 5-minute exposure preventive treatment has no effect on prevention of stress-dependent changes in blood rheological properties and functional activity of erythrocytes. However, in male rats a positive trend is observed, in contrast to female rats, the study of blood rheology at the shear rates of 300, 200, 150, 100, 50 and 20 s<sup>-1</sup>. 15 and 30-minute regimes preventive effects of electromagnetic terahertz waves at frequencies MSIP nitric oxide 150.176-150.664 GHz are effective and completely prevent stress-dependent blood viscosity disorders and functional activity of erythrocytes in male and female rats in the Dioestrus and Oestrus phases of estrus cycle. (14 References).