DETERMINATION OF ANTIOXIDANT ACTIVITY OF BLOOD SERUM UNDER CHRONIC EXPOSURE TO 460 MHs ELECTROMAGNETIC RADIATION

Abbasova M.T.

A.I.Karayev Institute of Physiology of Azerbaijan National Academy of Sciences,

biokimya_65@mail.ru

Activation of lipid peroxidation as universal consequence of influense of various extreme agents, including electromagnetic radiation, on live system result in increased oxidative metabolism of complex organic structures. For inhibition of universal mechanisms of formation in lipid peroxidation of free radicals in the body, there antioxidant system, which includes in its membership the complex intracellular enzymes that counteract oxidative stress and neutralize free radicals. Imbalance between the amount of generated active oxygen and antioxidant defense mechanisms of cells leads to excessive formation conditions and generates radicals, which are often called “oxidative stress”. With a significant increase in the content of lipid peroxidation products endogenous antioxidant system becomes unable to maintain the balance of proantioksidants that leads to the development of oxidative stress – one of the universal mechanisms of tissue damage. Simultaneous study of both systems’ activity is a good tool for identifying the impact of the specificity of a particular environmental factor. In today's world, the electromagnetic radiation (EMR) in the radio and microwave bands have become an integral part of human activity, therefore, to study their effects on redox homeostasis has great relevance. This work was carried out in order to identify changes in the total oxidant and antioxidant activity in plasma and red blood cells under the influence of chronic exposure to 460 MHz EMR. White rats were irradiated for 1 month 20 minutes a day for of power density - 30 mVt/cm^2. Total oxidant and antioxidant activities of plasma and red blood cells were determined by the A.M.Goryachkovsky method (1996). Relatively high intensity exposure of rats results in a decrease in total plasma antioxidant activity (compared to control), whereas oxidant activity undergoes slight oscillations. A significant increase in antioxidant activity was observed in erythrocytes when rats were irradiated 460 MHz EMR. Decrease in the total antioxidant activity of plasma and persistent increase in the level of free radical oxidation products gives reason to talk the imbalance in the antioxidant defense system of the blood and the body as a whole, which is an unfavorable factor in the pathological process and requires effective measures of metabolic correction.

Thus, in the plasma due to decrease of total antioxidant activity is strengthening of formation free radical process in animals. These data support the idea that the biological effects of non-ionizing EMR can realize by free radical processes.