

exposure of the organism of animals under experiment leads to the stabilization of the processes of peroxidation against the increase of antioxidant system activity.

**Key words:** remaxol, heat exposure, biological membranes lipid peroxidation, products of peroxidation (lipid hydroperoxides, diene conjugates, malonic dialdehyde), antioxidant system.

Heat stress leading to the development of different disregulation processes directed to the transformation of the formed homeostasis creates favourable conditions for the radicals formation and contributes to the depletion of intensity of antioxidant system in the warm – blooded organism [1, 4]. During adaptation of the organism to heat disproportion in the hormonal and energy state of anabolic processes is observed, deficiency of bioenergetic resources and hypoxia of tissues occur [5]. A complex mechanism of development of hypoxia in the organism, multi – component system of biochemical and metabolic processes appearing in the case of different pathology explain difficulties in administering the drugs correcting functions of the respiratory chain and other metabolic processes bringing energetic substrata. In this case, the use of drugs containing succinic acid which is one of metabolites of Krebs cycle is perspective [2, 3].

**Materials and methods.** In experimental conditions the possibility to correct free radical lipid oxidation of rats' organism membranes was studied with the introduction of the succinate containin drug called remaxol (Polysan, St.Petersburg). The animals were divided into 4 groups and each of them had 30 rats: intact animals which were held in standard conditions of vivarium; the control group in which rats were exposed to heat during forty-five minutes daily; the experimental group in which before the effects of heat animals had a daily intake of the remaxol in a dose of 50 mg/kg; the experimental group in which before the effects of heat animals had a daily intake of the remaxol in a dose of 100 mg/kg. The intensity of peroxidation processes was assessed by examining the contents of hydroperoxides lipids, diene conjugates, malonic dialdehyde and the main components of the antioxidant system, (ceruloplasmin, vitamin E) in the liver homogenate animals. The results obtained were subjected to statistical analysis with calculation of parametric criteria Student.

It was found out that in the liver tissue of experimental animals a daily heat exposure during forty-five minutes contributes to the increase of lipid hydroperoxides level (by 34 – 41%), of diene conjugate (by 45 – 50%), and of malonic dialdehyde (by 62 – 74%) against the decrease of antioxidant system activity in the liver of intact animals. The introduction of the remaxol to rats in the conditions of heat exposure contributes to the reliable decrease in the liver of lipid hydroperoxides by 22 – 34%, of diene conjugates – by 21 – 33%, and of malonic dialdehyde by 33 – 43% in comparison with the rats of the control group. While analyzing the effect of the remaxol on the activity of the components of antioxidant system it was shown that the level of ceruloplasmin in the liver of animals was reliably higher by 35 – 44%, of vitamin E by 28 – 43% in comparison with the same parameters of the rats of the control group.

So, the application of the remaxol in the conditions of long heat exposure of the organism of animals under experiment leads to the stabilization of the processes of peroxidation against the increase of antioxidant system activity.

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DOI: 10.22448/AMJ.2016.15-16.35-37

UDC 615.451:612.014

#### PHYTOCORRECTION OF OXIDATIVE STRESS IN EXPERIMENT

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**Abstract** The search and development of methods for correction of oxidative stress in conditions of exposure to adverse environmental factors is a topical problem of modern medicine. In experimental conditions the possibility to correct free radical lipid oxidation of rats' organism membranes was studied with the oral introduction of the tincture of herb convolvulus that contains the complex of natural antioxidants. The applica-

tion of the mentioned tincture in the conditions of oxidative stress induced by the influence of ultraviolet rays leads to the stabilization of the processes of peroxidation against the increase of antioxidant system activity.

**Key words:** the tincture of herb convolvulus, oxidative stress, ultraviolet radiation, biological membranes lipid peroxidation, products of peroxidation (lipid hydroperoxides, diene conjugates, malonic dialdehyde), antioxidant system.

The results of the researches conducted during recent years have showed that ultraviolet irradiation promote activation of lipid peroxidation of cell membranes that has rather far-reaching implications for a warm-blooded organism [2, 3]. Unsaturated fatty acids under the influence of ultraviolet rays are easily to oxidized into peroxide compounds, and lack of natural antioxidants because of the conditions where air, water and food are polluted can cause oxidative stress that is a pathogenetic factor for progression of many diseases [4]. The details of the researches in this important sphere of the effects of ultraviolet irradiation are fragmented, whereas it is obvious that the consequences of damage of membrane components caused by ultraviolet irradiation are quite significant, and at the present stage this calls the necessity of more detailed investigation of possible ways that can help to correct the processes of lipid peroxidation in the ultraviolet-induced biomembranes of warm-blooded organisms.

**Materials and methods.** In experimental conditions the possibility to correct free radical lipid oxidation of rats' organism membranes was studied with the oral introduction of the tincture of herb convolvulus that contains the complex of natural antioxidants [5]. The animals were divided into 3 groups and each of them had 30 rats: intact animals which were held in standard conditions of vivarium; the control group in which rats were exposed to ultraviolet radiation during three minutes daily [1]; the experimental group in which before ultraviolet radiation animals had a daily oral intake of the tincture in a dose of 5 ml/kg. The intensity of peroxidation processes was assessed by examining the contents of hydroperoxides lipids, diene conjugates, malonic dialdehyde and the main components of the antioxidant system, (ceruloplasmin, vitamin E) in the plasma of blood animals. The results obtained were subjected to statistical analysis with calculation of parametric criteria Student.

It was found out that in the blood of experimental animals a daily ultraviolet radiation during three minutes contributes to the increase of lipid hydroperoxides level (by 17 – 24%), of diene conjugate (by 21 – 23%), and of malonic dialdehyde (by 29 – 34%) against the decrease of antioxidant system activity in the blood of intact animals. The introduction of the tincture to rats in the conditions of oxidative stress contributes to the reliable decrease in the blood of lipid hydroperoxides by 12 - 17%, of diene conjugates by 13%, malonic dialdehyde by 21 - 28% in comparison with the rats of the control group. While analyzing the effect of the tincture on the activity of the components of antioxidant system it was shown that the level of ceruloplasmin in the blood of animals was reliably higher by 20 – 25%, of vitamin E by 12 - 21%, of catalase by 12 - 20% in comparison with the same parameters of the rats of the control group.

So, the application of the mentioned tincture in the conditions of oxidative stress induced by the influence of ultraviolet rays leads to the stabilization of the processes of peroxidation against the increase of antioxidant system activity.

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DOI: 10.22448/AMJ.2016.15-16.37-38

UDC 591.494(678.048):616-001.18/.19

### NIKOLIZIN IN THE CORRECTION OF PROCESSES OF LIPID PEROXIDATION OF BIOMEMBRANES INDUCED BY THE COLD EXPOSURE

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**Abstract** Cold exposure stimulates the generation of reactive oxygen species that initiate the process of lipid peroxidation (LPO), due to the development of hypoxia, based on the increase in the rate of consumption of tissue oxygen necessary for energy supply, in conditions of increased heat production. The experimental evaluation of the effectiveness of nicolisin for the correction of peroxidation processes induced by the effect of cold, is relevant and opens perspectives in the regulation of various stress factors.

**Key words:** nicolisin, cold stress, biological membranes lipid peroxidation, products of peroxidation (lipid hydroperoxides, diene conjugates, malonic dialdehyde), antioxidant system.

Modern environmental conditions dramatically increased the level radiculopathic processes in the body [1, 2, 5]. Cold exposure stimulates the generation of reactive oxygen species, inducing peroxidation of lipids, resulting in the development of hypoxia [3, 4].

**Materials and methods.** In experimental conditions the possibility to correct free radical lipid oxidation of rats' organism membranes was studied with the introduction of the nikolizin. The animals were divided into 3 groups and each of them had 40 rats: intact animals which were held in standard conditions of vivarium; the control group in which rats were exposed to cold during three hours daily; the experimental group in which before cooling animals had a daily intake of the nikolizin in a dose of 30 mg/kg. The intensity of peroxidation processes was assessed by examining the contents of hydroperoxides lipids, diene conjugates, malonic dialdehyde and the main components of the antioxidant system, (ceruloplasmin, vitamin E) in the plasma of blood animals. The results obtained were subjected to statistical analysis with calculation of parametric criteria Student.

It was found out that in the blood of experimental animals a daily cold exposure during three hours contributes to the increase of lipid hydroperoxides level (by 18 – 50%), of diene conjugate (by 33 – 80%), and of malonic dialdehyde (by 22 – 37%) against the decrease of antioxidant system activity in the blood of intact animals. The introduction of the nikolizin to rats in the conditions of cold exposure contributes to the reliable decrease in the blood of lipid hydroperoxides by 14-22%, of diene conjugates – by 26-44%, malonic dialdehyde – by 20-25% in comparison with the rats of the control group. While analyzing the effect of the nikolizin on the activity of the components of antioxidant system it was shown that the level of ceruloplasmin in the blood of animals was reliably higher by 39-57%, of vitamin E by 22-33%, of catalase by 23-33% in comparison with the same parameters of the rats of the control group.

So, the application of the nikolizin in the conditions of long cold exposure of the organism of animals under experiment leads to the stabilization of the processes of peroxidation against the increase of antioxidant system activity.

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