

THE EFFECTS OF HIGH LEVEL NOISE AND α -ADRENOBLOCKER ON THE
OXIDATION INTENSITY OF WHITE RAT BLOOD

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Noise action can exacerbate a number of disorders, many of which are associated with the increase of stress hormones release and oxidative stress development. It is well known that the intensification of free radical oxidation (FRO) in cells is a universal mechanism of cell response on stress factors of different origin. It was shown, that proteins as well as lipids undergo modification as the result of FRO processes intensification and products of proteins oxidation serve as a more informative markers of oxidative damage of cells compare with lipids.

The aim of this investigation is assessment of the new α_2 -adrenoblocker Mesedin (2-(2-methylamino-4-thiazolyl)-1,4-benzodioxan hydrochloride, synthesized in the Institute of Fine Organic Chemistry, NAS RA as a regulator of the oxidation intensity of white rats plasma and erythrocyte membranes (EM) proteins, lipid peroxidation intensity and α -tocopherol (α -T) content in the studied samples under condition of noise action. Investigations were carried out on white male rats weighing 150-200 g. The animals underwent noise influence (91 dBA) with maximal energy in the region of average and high frequency during 8 hours (acute acoustic stress). To estimate protein oxidation intensity the spectrophotometric method based on the reaction of protein oxidation carbonyl derivatives (modified proteins) and 2,4-dinitrophenylhydrazine (2,4-DNPH) with 2,4-dinitrophenylhydrazones formation was used. Fluorimetric method has been used to determine α -T content in the studied samples.

The data obtained revealed an increase of carbonyl derivatives of protein oxidation both in plasma and EM proteins under the noise action correspondingly by 18% and 102%. Mesedin administration to the intact animals only slightly decreased the content of modified proteins in plasma. The administration of Mesedin to the animals 10 hrs prior the noise action leads to the sharp decrease of protein carbonyl derivatives content (76.5 and 47%) correspondingly in the plasma and EM. The observed changes were correlated with α -T content in the studied samples.

The results obtained revealed the carbonyl protein increased formation both in plasma and EM under the noise action. Administration of α_2 -adrenoblocker Mesedin to the animals prior the noise action significantly prevents oxidation of blood proteins components, more expressed in EM and reveals noticeable regulatory effect under the acute acoustic stress conditions.