ABSTRACT

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Title of Thesis: Evaluation of oxidative stress markers after intoxication with nerve agents and treatment with acetylcholinesterase reactivators

In this study, the influence of soman poisoning and treatment with atropine and some oximes on redox status in rat erythrocytes, liver and plasma were investigated. Male Wistar rats were divided into eight groups, each of six animals. The first group was exposed to atropine only, the second group to one LD_{50} of soman and atropine. The groups 3-7 were treated with soman, atropine and one of named oximes (HI-6, trimedoxime, K203) or with their combinations (HI-6 + trimedoxime, HI-6 + K203). The control (eighth) group was treated with saline solution only.

To study the markers of oxidative stress the TBARS method (thiobarbituric acid reactive substances), glutathion reductase activity and the FRAP (ferric reducing antioxidant power) method were chosen. There was plasma protein content and acetylcholinesterase activity assessed, too.

The experimental data showed significant alterations in followed parameters. The presence of oxidative stress is offset by enhanced activity of defense antioxidative mechanisms and it corresponds with the decreased of oxidative damage of lipids. Reduced acetylcholinesterase activity was registered, but there is not significant correlation between acetylcholinesterase activity and oxidative stress.

It was demonstrated that the poisoning by soman and treatment by above listed oximes is associated with changes in redox status. It could be inferred that the treatment by oximes has a positive influence on suppression of oxidative stress.

(Key words: oxidative stress, organophosphates, oxime reactivators)