Abstract

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Title of diploma thesis: In vivo evaluation of the efficacy of the novel reactivator against tabun.

This study tackles the problem of irreversible inhibition of acetylcholinesterase (AChE). This enzyme degrades neurotransmitter acetylcholine (ACh), wich ensures transmisson of nerve impulses in central nervous system and in periphery. Organophospates (OP) are substances that cause irreversible blocade of AChE and that susubsequently leads to accumulation of AChE in synapses and inducing of muscarinic and nicotinic effects for life threatening condition. Oximic nature reactivators shown to this day the gratest potencial in inhibiting OP bond with AChE.

Because reactivation abilities of to date synthesided oxime are not sufficient, new reactivators are being researched. The doal of my work was to test the potencial to reactivate AChe one of them (precisely oxime K 870).

The method i used was colorimetric Ellman method modified by Bajgar, where the activity of AChE after reactivation was measured by absorbance in brain, diaphragm and blood of modeled orgamisms. The orgamisms used were rats.

This experiment provide the posibility of comparison of reactivation capabilities of K 870 oxime with pralidoxime („golden standart“), atropine or HI-6. Rats were administered wiht a dose of tabun LD_{50} = 200 μg/kg intramusculary. Results cleary shows that pralidoxime (dose 179 mg/kg) reactivated AChE the weakest, where HI-6 (dose 81mg/kg) acomplished higher activity of the enzyme among those tested. The reactivation level in the brain was similar to that of pralidoxime, which means this compound potentialy rarely passed trough HEB and therefore reactiovation potencial headed to zero. In the diphragm the oxime K 870 is sufficient

to reactivate receptors but is not as effective as HI-6. Of all this factors arise that oxime K 870 can to a point reactivate AChE on peripheries.