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The reactivation effect of pralidoxime in human blood on parathion and paraoxon–induced cholinesterase inhibition

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Abstract:

In this investigation the reactivation of cholinesterases by pralidoxime in parathion and paraoxon intoxication in plasma and erythrocytes were studied. For this purpose, human plasma and erythrocytes were incubated with various concentrations of parathion (0.1-10 µM) and paraoxon (0.03-0.3 µM) at 37 oC for 10 min. Then, pralidoxime (10-300 µM) was added to the samples and incubated for 10 min before cholinesterases assay. The results showed that effects of parathion and paraoxon were dose dependent. These agents inhibited more than 85% of butyrylcholinesterase (BChE) and acetylcholinesterase (AChE) activity and the inhibitory effect of paraoxon was 10 times more than parathion. BChE activity was significantly higher than the control at 100 µM of pralidoxime and it reduced inhibitory effects of parathion to less than 50% and of paraoxon to 42% of control. When pralidoxime (10 µM) was added to erythrocytes, the inhibitory effects of two organophosphates were reduced to less than 15%. At higher concentrations of pralidoxime (>100 µM), both BChE and AChE activities were inhibited.

Keywords:

Cholinesterases ، Parathion ، Paraoxon ، Pralidoxime

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