A novel peptide protects against nerve agent poisoning

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The currently available antidotes for treatment of organophosphate poisoning are atropine, oximes and anticonvulsants while pyridostigmine is a prophylactic measure. The present study demonstrates a marked antidotal activity of the novel peptide QVP against toxicity of nerve agents. Paraoxon administration (female ICR mice, 1.8mg/kg, sc) caused death within 20 minutes of exposure whereas no mortality was observed in animals received a single injection of the peptide (1mg/kg, iv) 8 days prior to the nerve agent intoxication. This effect was well correlated with the pronounced peptide-induced reduction of the inhibitory effect of paraoxon on brain acetylcholinesterase activity which was 4 fold higher in the QVP-treated mice than the control group. No differences between peptide-treated and control groups were detected in serum paraoxonase and butyrylcholinesterase activities. A remarkable protection was also observed at an interval of 9 days between QVP treatment and paraoxon exposure while shorter interval of 7 days caused a weak protective effect. It should be noted that QVP was the only countermeasure used along these experiments, namely, neither atropine nor oximes were employed. The long interval between QVP treatment and paraoxon exposure indicates for a potential peptide-induced brain factor that modulates acetylcholinesterase activity and confers protection against nerve agent toxicity. (This work was supported by HDTRA contract number 1-13-1-0041).