

Investigation of the scopolamine effect on acetylcholinesterase activity

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Background and Aims: scopolamine is an anticholinergic drug that used clinically to treat organophosphorus agent intoxication. Scopolamine can increase acetylcholinesterase (AChE) activity in brain tissue. But effect of this drug on AChE in peripheral tissue is not studied. The aim of present study is to investigate the effect of scopolamine on AChE pure enzyme activity from human erythrocyte and invivo effect of scopolamine on AChE enzyme in brain and peripheral tissues.

Methods: male wistar rat was used in this study. Scopolamine was administered intraperitoneally (0.5 mg/kg) and 1 hours after administration, AChE activity in muscle, hippocampus, heart and diaphragm was measured by modified Ellman, s method. Invitro direct effect of scopolamine on AChE activity also was measured by this method.

Results: Intraperitoneal administration of scopolamine increased activity of AChE in all tissue samples. But scopolamine had direct inhibitory effect on AChE activity in invitro.

Conclusions: It is accepted that the major organophosphorus compounds intoxication symptoms are in the result of AChE inhibition. Our result showed that Scopolamine can directly inhibit AChE but by unknown mechanism cause AChE activity enhancement in tissues. The later effect has benefit for organophosphorus compounds intoxication then Scopolamine as antimuscarinic agent with peripheral and central effects can act by two mechanisms for detoxification: anti muscarinic activity like atropine, and increase AChE activity in peripheral and central nervous system.

Keywords: Scopolamine; Acetylcholinesterase activity; Antimuscarinic