

3536476 GRTX/M : MAJOR : TOXICOLOGY ; M.Sc. (TOXICOLOGY)

KEY WORD : ARSENIC / VITAMIN E / MUSCARINIC / ADRENERGIC

CHAOVALIT CHAOPANITWET : PROTECTIVE EFFECTS OF VITAMIN E ON ARSENIC INDUCED ALTERATIONS OF MUSCARINIC AND ADRENERGIC RESPONSES. THESIS ADVISOR : JUTAMAAD SATAYAVIVAD, Ph.D., PAWINEE PIYACHATURAWAT, Ph.D., PIMPRAPAI SANEEWONG NA AYUTHAYA, M.D. 115 p. ISBN 974-589-099-5

Previous studies indicated that arsenic can combine with sulfhydryl groups in several organs in the body. It has been known that binding sites of the muscarinic receptors contain sulfhydryl groups, therefore this study aimed to investigate the effects of arsenic on the cardiac and tracheal muscle contractions in response to muscarinic receptors activation. The responses to norepinephrine of alpha and beta adrenoceptors of descending aorta and atrium, respectively were also investigated. It was found that acute exposure of these tissues to arsenic ( $As^{+5}$ )  $10^{-3}$  M *in vitro* had no effect, however when it was given to the test animal 24 hr before sacrifice, it altered the responses of the test organs to ACh and NE. This pretreatment with arsenic ( $Na_2HAsO_4$ ) 10mg/kg BW, IP 24 hr resulted in the decreased responses of muscarinic receptors to acetylcholine (ACh) in isolated rat atria, and trachea. The increased response of alpha-adrenoceptors to norepinephrine was observed in descending aorta. The decrease in positive chronotropism of norepinephrine was detected. The analysis of the dose response curve revealed that there was no alteration in binding affinity of norepinephrine to cardiac beta-adrenoceptors. The results from this study demonstrated that decreased cardiac and tracheal responses to ACh were observed only when test animals were treated with arsenic ( $Na_2HAsO_4$ ). These results indicate that toxicity of arsenic may be due to its metabolites. Under the present experiment protocol, the effects of arsenic on decreasing tracheal response to ACh were partially reversed by Vitamin E and BAL (Dimercapral).