A Comparative Histological and Biochemical Study on the Use of Vitamins C, E and Alpha - Lipoic Acid Either Separately or in Combination on Acute Hepatic Toxicity with Malathion

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Abstract:

Introduction: Malathion is one of the most popular organophosphorous insecticides. Free radical damage is an important direct or indirect factor involved in malathion poisoning. Aim of the Work: The objective of the present study was to estimate the role of vitamin C, vitamin E and alpha-lipoic acid either individually or in combination, in amelioration of acute hepatic toxicity induced by malathion. Materials and Methods: Sixty adult male albino rats were divided into six equal groups. Group 1served as control. Group 2 received malathion (1000 mg/kg body weight) once orally. Group 3 received malathion + vit.C (200 mg/ kg) once i.p. Group 4 received malathion + vit. E (150mg/kg) once i.m. Group 5 received malathion + alpha- lipoic acid (25mg/kg) once i.p. Group 6 received malathion+ vit. C + vit.E + alpha-liopic acid. Animals of all groups were sacrifi ced after 24 hours. Histological examination of the liver was performed. Biochemical assay of superoxide dismutase (SOD) activity and total thiols as antioxidant indices, thiobarbituric acid reactive substances (TBARS) as an index of lipid peroxidation (oxidative stress indices), aspartate aminotransferase (AST), alanine amino transferase (ALT), total protein, albumin and globulin as liver function tests was done. Results: Light and electron microscopic examination of liver of group 2 exhibited foci of altered cells with dense nuclei and vacuolated cytoplasm, mononuclear cell infi ltrations in portal areas, electron lucent areas in the cytoplasm of the hepatocytes, marginaton of nuclear chromatin. Biochemical analysis showed a signifi cant increase in the serum levels of SOD, total thiols, TBARS, AST, ALT, total protein and globulin as compared to control. Treatment by any of the antioxidants variably reduced the hepatic structural changes induced by malathion,while combined treatment resulted in a signifi cant degree of recovery. There was signifi cant decrease in serum levels of all biochemical parameters when treated with one or combination of antioxidants (vitamin C, E or lipoic acid). Conclusion: Combination of the previous antioxidants could be used as helpful therapeutic line in treatment of acute hepatic toxicity with malathion rather than their use separately.

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