

Protective Role of Vitamin E and/or Methionine against Lead-Induce Changes on Hematological Parameters in Rabbits

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Abstract

Background	The importance of lead as a toxic metal and environmental pollutant has long been recognized to human and animal health. In Iraq, lead pollution was documented in Baghdad and in Sulaimaniya city.
Objective	To explore the protective role of vitamin E alone or in combination with the amino acid methionine against lead acetate side effects on hematological parameters of adult male rabbits.
Methods	Thirty male adult rabbits were divided equally into five groups four of them administered lead acetate for 90 days, as sub-chronic exposure, and the fifth was considered as control. Three of these groups were treated with Vitamin E and/or methionine for 90 days. At the end of experiment, blood and liver samples were collected for either hematological analysis or histopathological examination.
Results	Lead caused a significant decrease in lymphocytes and erythrocyte indices; and a significant increase in reticulocytes and neutrophils. At the same time, Vit. E, alone or mixed with methionine, corrected these values to semi normal values.
Conclusion	Decreased erythrocyte indices and reticulocytosis that is found in the present study, demonstrates regenerative anemia in rabbits that had administered lead acetate. Vitamin E, alone or mixed with methionine, was efficient in reducing the side effects of Lead on hematological parameters; while, methionine had little or no effect when administered alone against lead which may be attributed to the dose or duration of the treatment.
Keywords	Lead; vitamin E; methionine; hematological changes

Introduction

The importance of lead as a toxic metal and environmental pollutant has long been recognized to human and animal health^(1,2) in Iraq as well as other parts of the world. Lead pollution was documented, particularly in Baghdad⁽³⁾.

The mechanism by which lead affects the human body is extremely complex. On an atomic level, lead can induce a wide range of adverse effects in humans depending on the dose and duration of exposure^(4,5). Lead induces the production of reactive oxygen species (ROS) that result in lipid

peroxidation, DNA damage, and depletion of cell antioxidant defense systems⁽⁶⁾. The toxic lead effects on the hematologic system^(5,7), thus, cause a slowly developing hypochromic normocytic or microcytic anemia⁽⁸⁾.

Vitamin E is naturally occurring antioxidants that play important roles in health by inactivating harmful free radicals produced through normal cellular activity and from various stressors⁽⁹⁾. The protective mechanism of vitamin E against lead toxicity could be attributed to its antioxidant property or its location in the cell membrane and its ability to stabilize membrane