The Impact of Ascorbic acid on Histopathological, Biochemical, Pharmacological, and Immunological Toxicity of Chronic Lead acetate Exposure on The Spleen in a Rat Model.

Abstract

Objective: to evaluate the effect of vitamin C on histopathological, biochemical, and Immuotoxicity of chronic lead exposure in the spleen of a rat model.

Methods: The rats were alienated into five groups, of 10 rats each: Group I received normal saline orally as a control group. Group II, III: received lead acetate for (4, and 8 weeks) respectively. Group IV, and V: received lead acetate and vitamin C for (4, and 8 weeks) respectively. The spleen was excised and processed for light, electron microscopic, histopatholoigcal, and biochemical analysis, Quantitative assessment of matrix metalloproteinase-2 (MMP-2), MMP-9, interleukin-2 (IL-2), IL-6 and Tumor Necrosis Factor alpha (TNF-α) gene expression were performed by real-time polymerase chain reaction**.**

Results: The examination of control and vitamin C with lead acetate supplemented groups revealed normal splenic architecture. Contrastingly, the spleen of lead-intoxicated groups exhibited degenerative changes on the spleen, with a significantly decreased expression of IL-2, glutathione peroxidase, superoxide dismutase, and hemoglobin ($p< 0.05$), with significantly promoted proinflammatory cytokine (IL-6 and TNF-α) expressions, concomitantly with encouraged oxidative products (malondialdehyde) and protease enzymes (MMP-2 and-9) in the spleen tissues. The co-administration of vitamin C with lead for 4 weeks markedly resolved these changes.

Conclusion: This study may specify the efficiency of vitamin C in lead toxicity prevention on the spleen, represented by the reduced splenic harmful changes produced by lead administration.