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Morphological changes in liver, kidney tissues of animals' exposure to lead acetate

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Abstract: *The study was carried out to evaluate changes induced by lead acetate toxicity in 20 wistar rats which were divided into 3 different groups I, II and III. Animals of group I received singlnormal saline only as a control group. G II received one injection intraperitoneally of lead acetate (8 mg) only, while group III received lead acetate and herbs extract of Cyprus esculentus (drinking with water for period of 4 weeks). Rats were sacrificed on 15th and 30 days of treatment and tissues obtained for histological evaluation included liver, kidney, and heart .Liver tissue showed changes ,necrosis with depleasion in the glycoprotein granules inside the hepatocyte cells , there is no changes in kidney and heart tissue .*

I. Introduction

Among heavy metals lead is the most ubiquitous common pervasive environmental pollutant having diverse and deleterious effects on man and animals health. Lead induces a wide range of physiological, biochemical and behavioral dysfunctions. Main target organs of lead toxicity are liver, spleen and testes (1). Many reports are available regarding lead toxicity and the deleterious effects in various species of animals but very few researchers tried to correlate pathomorphological changes of lead acetate at different dose levels in laboratory animals especially in rats as they considered as a suitable animal model (2).

II. Cyperuse sculentus

Cyperuse sculentus (or chufa sedge, nut grass, yellow nutsedge, tigernut sedge, or earth almond) is a crop of the family (Cyperaceae) native to warm temperate to subtropical regions of the Northern Hemisphere .They are quite hard and are generally soaked in water before they can be eaten, thus making them much softer and giving them a better texture (3).It is used as antidioxide (because of its high content in vitamin E) it helps slow down the ageing of the body cells.

Therefore, this study was designed to study the effect of lead acetate on the histology of the liver, kidney, heart tissues and a possible testicular regenerative effect of Cyperusesculentus Extract.

III. Materials and Methods

Lead acetate toxicity was carried out on 20 male rats weighing about 25-35 gm randomly divided into groups I, II and III. Animals of group I received single intraperitoneally normal saline only as a control group. GII received one injection intraperitoneally of lead acetate (8 mg) only (4), while group III received lead acetate and herbs extract of Cyprus esculentus(drinking with water for period of 4 weeks).Cyprus esculent used were purchased from a local market in Syria. It was rinsed to remove sand and other debris. Soak two table spoons of cyperus for the whole night in the water, then mashed and filtered (5). Rats were sacrificed on 15th and 30 days of treatment and tissues obtained for histological evaluation included liver, kidney,and heart. All tissues were placed in 10% buffered formalin, then embedded in paraffin, and stained with hematoxylin and eosin (H&E).

IV. Results and Discussion

Histopathological examination of the control and different experimental groups shows: control group demonstrated normal architectural appearance of hepatocyte cells with sinusoidal Dilation and glycoprotein accumulation inside the cells (Fig. I), and normal section tissues for kidney and heart. In contrast, in the lead acetate treated group, the liver tissue showed massive degeneration changes and dispersed hepatocyte cells necrosis with depleasion in the glycoprotein granules inside the hepatocyte cells (Fig. II). similar hepatotoxicity lesions were also reported by Neathery and Miller, 1975 (6) who reported that lead (Pb+2) is a heavy metal that causes various destructive effects. In human, increased levels of lead causes many serious diseases and dysfunction of organs (7).These results also agree with Banu and Sharma, 2005 (8) and Shalan et al. 2005 (9) .The pathomorphological lesions in liver may be due to the action of lead on hepatic glycogen, DNA content and the ability to incorporate amino acid into protein (10).

Section from animal received lead acetate and treated with herbal extract showed a slight change from normal histological features, with mild accumulation of glycoprotein granules (Fig.III). Cyperus esculentus extract

relatively improves the induced histopathological changes in liver tissue of rats and this improvement may be act as an antioxidant or DND server.

The renaland heart tissues didn't revel any changes in normal tissue in animal treated with lead acetate and with lead acetate and herbs.

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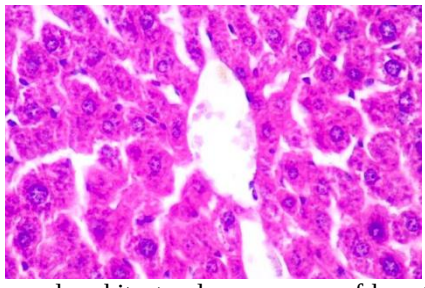

Fig. I : Control liver cells showed normal architectural appearance of hepatocyte cells with sinusoidal Dilation and glycoprotein accumulation inside the cells. X40 (PAS).

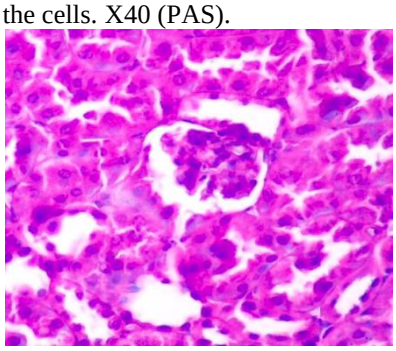

Fig II: Section in liver tissue showed degeneration and necrosis cells with depleasion in the glycoprotein granules inside the hepatocyte cells. X40 (PAS).

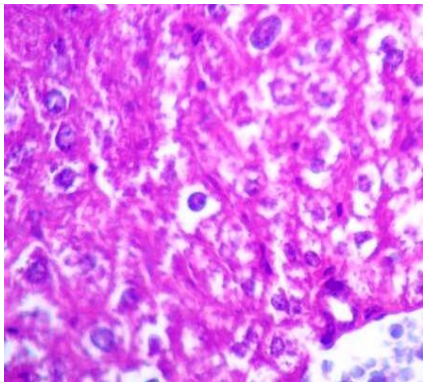

Fig.III: Section from animal received lead acetate and treated with herbal extract showed a slight change from normal histological features, with mild accumulation of glycoprotein granules. X40 (PAS).