

Faculty of Medicine

Department: Forensic Medicine

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Title: Immunotoxicological study of one of the most common over-the-counter pyrethroid insecticide products in Egypt

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Abstract:

A commonly available aerosolized pyrethroid insecticide containing deltamethrin and imiprothrin is widely used for hygienic control in Egypt. The immunotoxic effects after inhalation exposures to the preparation of each for 2, 10 and 30 days were investigated in rats. For each exposure, the insecticide (containing 0.2% imiprothrin and 2.5% deltamethrin) was sprayed in all directions in a room (using a special attachment located in the ceiling in the centre of the room) for 30s each minute for 15 min. the room was then kept closed for 15 min. After each spray interval, the rats were introduced for 30 min and then removed to a clean room. The exposure process was repeated a total of three times on each day of the respective regimens. The interval between the 15 min spray/15 min pause/30 min rt exposure cycles was 120 min . Twenty four hours after the final exposure in each particular regimen, the cohort rats in the regimen (air and exposed) were weighed, sacrificed, and their tissues were removed for analyses . Immunological tests performed included assessments of potential changes in immunopathology (determined from body and splenic weights). humoral mediated immunity (based on plaque-forming activity of spleen cells), cell-mediated immunity (determined from splenic lymphocyte responsiveness to stimulation with phytohemagglutinin and immune cell (sub) type profile analyses), and nonspecific immunity (based on phagocytic activity of peritoneal macrophages). The results indicated that of all the endpoints examined , among the rats exposed over a 2-day period to the imiprothrin and deltamethrin containing insecticide aerosol, the only significant change noted (relative to values from time matched controls) was in the level of splenic CD⁴⁺, CD⁸⁺ and CD⁴⁺, CD⁸⁺ cells. In contrast, exposures on each day of a 10 day period led to significant decreases in several endpoints, exceptions to this were values for body and spleen weight (unaffected), splenic OX12⁻OX19⁺ levels (significant) and VD⁴⁺ CD⁸⁺ levels (unaffected relative to control), Rats exposed for 30 days displayed significant decreases each test applied. Rats exposed for 30 days displayed significant decreases in each test applied except for increases in both splenic OX12⁻OX19⁺ and CD⁴⁺ CD⁸⁺ cell levels relative to corresponding control rate values. The present study findings indicate that repeated noncontinuous inhalation of a commonly utilized insecticide that contains imiprothrin and deltamethrin can cause a variety of immunotoxic effects in sites distal to the lungs.

Faculty of Medicine

Department: Forensic Medicine and Clinical Toxicology

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Title: Comparative study of the protective effect between deferoxamine and deferiprone on chronic iron overload induced cardiotoxicity in rats

Authors: A.M Emara, R.S El Kelany and K.A Moustafa

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Abstract:

Patients with iron overload frequently suffer from hemochromatosis of major organs, such as the heart and liver. Heart affection is the most common cause of death in patients with iron overload. Although the beneficial effects of deferoxamine (DFO) on iron-associated mortality are well documented, the role of deferiprone in the management of transusional iron overload is controversial. The aim of this study was to compare the protective effect of iron chelators (DFO and deferiprone) individually and in combination with the anti-oxidant (vitamin C) in the prevention of myocardial damage. Sixty albino rats were divided into six groups: two control groups (non-iron-loaded and iron-loaded) and four iron-loaded groups classified as follows: DFO group, DFO combined with vitamin C group, deferiprone group and deferiprone combined with vitamin C group. Heart tissue and blood samples were taken for histopathological examination of the heart, determination of total iron-binding capacity, 8-OH-deoxyguanosine (8-OH-dG), myocardial lipid peroxidation and glutathione (GSH) content. Less histopathological cardiac changes and a significant decrease in all biochemical parameters, except myocardial GSH, were observed in the deferiprone group. The addition of vitamin C improves the biochemical and histopathological changes in comparison to those rats administered DFO or deferiprone individually.

Key words:

Biochemical study, deferiprone, deferoxamine, heart tissue, histopathological changes vitamin C.