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Research Article

Anatomical and histological alternations of the spleen in rat, *Rattus norvegicus* exposed to mercury

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Abstract

This study aimed to investigate the histological, morphological and histochemical structures of the spleen of rats exposed to mercury chloride. Sixteen adult rats, *Rattus norvegicus* were obtained and divided into two groups as a control group that orally administered distilled water daily for ten weeks, and the second group administrated $Hgcl_2$ at a dose of 3mg\kg B.W\IP three times weekly. The results showed a significant difference as a decrease in the weight of the spleen of treated rats and an increase in the mean length of the spleen. There were significant differences in capsule thickness and the diameter of lymphoid follicles of the spleen compared with the control group. The mean capsule thickness significantly decreased, while the diameter of lymphoid follicles was increased. The histological examinations revealed lymphoid hyperplasia and proliferation of the red pulp (PALS) macrophage with vacuolated sub capsular cells, haemosidrosis with fibrous tissue, and aggregation of inflammatory cells with giant cells, aggregation of necrotic foci and minerals in granuloma center. In addition, in the PAS staining, alternation and necrosis of splenic cord, accumulations of hemosiderin in the red pulp, cellular degeneration and necrosis with an accumulation of adipose tissue, and degeneration of lymphocytes in the cortical area of the splenic corpuscle were observed. The Mallory trichrome staining revealed necrosis and degeneration of endothelial cells with loss of nuclei, degenerations of germinal center and necrosis of medullary sinuses in addition to hemosiderin accumulations.

Keywords: Parasitic contamination, Vegetable, Worm, Protozoan.

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Introduction

Mercuric chloride ($HgCl_2$) is used in a broad group of disinfectants because it has a strong sterilization ability. This feature makes it used in ointments to treat skin infections and sores (Jaya et al. 2009). Mercury is a hazardous chemical that can form many toxic organic compounds (Ostrovskii et al. 2000). Environmentally, mercury's physical and chemical states are complex and rely on several environmental factors, such as sediment in soil, the percentage of organic and trace substances in the water, pH, sunlight, and the adsorption to solid particles (Benes & Havlik 1979).

Mercury absorbs from the skin and the intestinal tract. It does difficulty cross the blood-brain barrier but can accumulate in the placenta (Berlin 1986). Hg compounds affect specifically the central nervous system (CNS), while the kidney is the target organ