EFFECTS OF TCDD ON BLOOD CONSTITUENTS AFTER SHORT AND LONG TERM ORAL APPLICATION IN ALBINO RATS

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Abstract:

The deterioration of environmental quality through contamination of air, water, soil and food has existed as a serious problem under the ever-increasing population and industrialization of the society. Dioxins are considered of the most dangerous environmental pollutants that persist and bioaccumulate in different environmental compartments. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) was shown to be highly toxic compound to different animal species. The environmental and health effects of this compound which, is a member of a large family of halogenated aromatic hydrocarbons, have been studied. In this study, the effects of TCDD on the hemogram of albino rats have been studied after oral exposure to sublethal doses for short and long term. In the first experiment, rats were once orally intubated with 4.4 μg/kg body weight TCDD in corn oil while in the second one; rats were intubated 0.44 μg/kg body weight TCDD in corn oil day after day for 12 weeks. Exposure of albino rats to TCDD results in variable degree of anemia as significant decrease in RBCs, Hb and PCV has been recorded in acutely toxicated animals. This decrease indicates microcytic hypochromic anemia in acutely TCDD-orally-exposed rats. Meanwhile, in long term toxicity animals, there was significant increase in RBCs and PCV accompanied with decrease in Hb concentration which indicates macrocytic hypochromic anemia. Total Leucocytic count showed significant decrease in animals acutely or chronically treated with TCDD after 24 hours and till the end of the experiments. These results were accompanied with hypoplasia of bone marrow of the tested animals as significant decrease was recorded in lymphocytes, monocytes and eosinophils count as well as their percentages. TCDD has myelotoxic effects on bone marrow appeared in the form of hypoplasia as well as apoptosis of its cellularity. Lymphocytes, monocytes, eosinophils and megakaryocytic series were severely affected by feeding TCDD. These effects shown to be time-dependant as it increases with the elongation of the time of exposure. Anemia together with bone marrow affection and other parameters of impairment of hepatic functions are indicative for hematotoxic effects of TCDD.

Keywords:

Toxicity - TCDD - blood - CONSTITUENTS

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