Case Report

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Toxico-pathological impact of subacute exposure to Acephate on health biomarkers of broiler chicks

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Abstract

The present study is to research the immunotoxicopathologic effects of environmental contaminant acephate (Ace) in experimentally visible at some point old White Leghorn broiler chicks (n = 150). The Ace was reconstructed in groundnut oil as vehicle (1 ml/kg) to obtain a final concentration of a single dose to the birds 21.3, 28.4 and 42.6 mg/kg body weight (BW) for twenty eight days of the experiment through stomach tube. The chicks in the vehicle controller group was given groundnut oil 1 ml/kg only while the chicks of plane control group received only ad lib standard feed and water. Birds exposed to high dose (42.6 mg/kg BW) showed signs of toxicity (salivation, lacrimation, gasping, convulsions, frequent defecation and tremors). The birds exposed to low dose Ace showed marked increase in the body weight of chicks while medium and high doses (28.4 and 42.6 mg/kg) showed significantly ($P \leq 0.05$) decreased body weight. Nonsignificantly ($P \geq 0.05$) decreased TEC, Hb concentration; PCV and TLC were observed within the high dosed group as compared to regulate and other low dosed fed birds. Initially a non-significant compensatory increase followed by significant decrease in serum protein was observed during the study period. Serum albumin showed a big ($P \leq 0.05$) decrease in high dosed Ace fed birds on 28th day of study. Non-significant increase and significant decrease in serum on 14th and 28th day of study was observed respectively. The AChE activity was significantly ($P \leq 0.05$) decreased in blood, serum and plasma in Ace fed birds compared to regulate birds. we found significantly ($P \leq 0.05$) higher levels of serum ALT and AST in Ace fed birds as compared to regulate . During the experimentation Ace had showed dose dependant immunosuppressive effect on humoral immune response of birds from 28th day of experimentation. The Bursa of Fabricius in treated birds showed increased interfollicular animal tissue proliferation, severe moderate cytoplasmic vacuolation, edema, and degenerative changes like pyknosis and fragmentation of nuclei that depleted the follicles of lymphoid cells. In the spleen, disorganization of follicular patterns, severe congestion, cytoplasmic vacuolation, degenerative changes, and hyperplasia of reticular cells were noted. The thymus in treated birds showed congestion, hyper-cellularity, and a presence of immature monocytes within the medullary region, also as myoid cell necrosis. In conclusion, these studies clearly demonstrated that Ace could induce immuno-toxicopathological effects on health biomarkers of broiler chicks.

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