

Pulmonary modulation of benzo[a]pyrene-induced hemato- and hepatotoxicity in broilers

ABSTRACT

Aftermath in several air pollution episodes with high concentrations of polycyclic aromatic hydrocarbons did not significantly affect health and performance of broilers despite its renowned sensitivity to polycyclic aromatic hydrocarbons. The aim of the study was to elucidate the previous lack of response in birds exposed to such severe episodes of air pollution. Benzo[a]pyrene (BaP) was used to simulate the influence of air pollution on hematology, selected organ function, and oxidative stress in broilers. One-day-old chicks were assigned to 5 equal groups composed of a control group, tricaprylin group, and 3 groups treated with BaP (at 1.5 micro g, 150 micro g, or 15 mg/kg of BW). The BaP was intratracheally administered to 1-d-old chicks for 5 consecutive days. The hematology, liver and kidney function, P450 activity, and malondialdehyde level especially in the group receiving 15 mg of BaP/kg of BW demonstrated evidence of hemato- and hepatotoxicity via BaP-induced oxidative stress. The deleterious effect of exposure to high concentration of BaP in broiler chickens was probably due to the anatomy of this species and the half-life of BaP. Although the effect of BaP may be transient or irreversible, pathogen challenges faced during the period of suppression may prove fatal.

Keyword: Benzo[a]pyrene; Broiler; Hematotoxicity; Hepatotoxicity; Oxidative stress