

Immunoregulatory Response following Benzo-A-Pyrene Instillation in Embryonated Chicken Eggs

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Abstract

Benzo[a]pyrene (C₂₀H₁₂, BaP), is a five-ring polycyclic aromatic hydrocarbon compound that is found in high concentrations during biomass-based air pollution. Although being reported as mutagenic, carcinogenic and immunosuppressive in chickens, its *in ovo* effect has not been documented. Thus, this study was conducted to assess the immunosuppressive action and related pathological changes of lymphoid organs of embryonated chicken eggs and hatchling following intra-allantoic instillation of BaP. The embryonated eggs were divided randomly into two groups, namely control and treatment groups. The treatment group was inoculated with 0.81 mg/mL BaP via the intra-allantoic route, while the control group was similarly inoculated with tricapylin. Candling was daily and embryos that died during the experiment were removed while allantoic fluid and yolk were harvested. The embryos that survived until hatching were bled via the intra-cardiac route and subsequently sacrificed on day 3 post-hatching via cervical dislocation and immediately necropsied. This study showed that embryonated chicken eggs which were exposed to BaP produced higher antibody titer against ND. Likewise, histologic appearance of the lymphoid organs showed evidence of hyperplasia as suggested by increase in cellular density of the tissues. This study showed that BaP has the potential to cross the allantoic barrier and adversely affect the embryo development.

Keywords: Benzo-a-pyrene (BaP), immunoregulatory, allantoic route, embryonated chicken eggs.