IMPACT OF CARBARYL ON LUNGS OF BROILER CHICKS

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ABSTRACT
The present study showed the effects of different levels of carbaryl on broiler chicks. Twenty broiler chicks were taken for the present study and divided into four groups, one group taken as control and three as treated groups were fed with three different doses of carbaryl as 15mg/kgbw(low dose), 20mg/kgbw (intermediate dose) and 25mg/kgbw (High dose) for 21 days. Lung were selected for the histopathological study and effects of different levels of carbaryl were studied in lung tissue. Congestion was seen in low dose treated group but birds exposed to intermediate dose and high dose showed mild congestion and pneumonitis as compared to control.

KEY WORDS: Lung, histopathology, carbaryl, broiler chicks.

INTRODUCTION
Pesticides are chemicals used to kill insects, rodents, and weeds that might harm our crops and our health. But pesticides also poison and kill other living things, including helpful plants, animals, and people. Pesticides can drift for miles from where they are applied and pollute the soil, the water, and the air. The health effects of pesticides depend on what pesticides are present and the length and frequency of exposure.

The use of insecticides in agriculture in recent years has increased tremendously and overshadowed all other control measures as means of crop protection. However, their use in agriculture and veterinary practices has also been associated with numerous health problems in man and animals (Benbrook, 1991). Among the various problems associated with pesticide use is the possibility of its biological accumulation in animal products such as milk, meat and egg, which are consumed by human beings (Kutches et al., 1970).
Pesticides may irritate skin or eyes, may cause cancer, or may affect the nervous, endocrine or hormone systems (EPA). Respiratory, allergic, gastrointestinal or neurological symptoms may be associated with being exposed to high levels of pesticides for a short time. Long-term exposure could result in Alzheimer’s, Parkinson’s, and other neurologic diseases (Centers for Disease Control and Prevention).

Exposure of poultry to pesticides often results in numerous health hazards and economic losses, in addition to posing a threat to public health, due to the presence of pesticide residues in poultry meat (Hisashi et al., 2006; Ellis, 1989).

MATERIAL AND METHOD
Twenty broiler chicks (Gallus gallus) of weight ranging from 25-30 gm. were used in the experiments. Broiler chicks were purchased from Gajaria farm, Lucknow. The experiment was conducted in the Laboratory of Reproductive Biology, D.G. College, Kanpur and Central Drug Research Institute, Lucknow. Broiler Chicks were quarantified for 10 days and it was confirmed that they were free of pathogen and any other disease.

Broiler Chicks were kept in conventional condition (open system) and housed in stainless steel cages (800×14cm2) in animal house with room temperature 22±3°C, relative humidity 50-70%, photo period of 12 hrs. Light and 12 hrs. dark. They were provided with commercial broiler chick starter diet and water ad libitum.

EXPERIMENTAL DESIGN
The chicks were randomly and equally distributed into four equal groups. The control group received feed without Carbaryl. The second low dose group was given carbaryl at 15mg/kgbw, the third intermediate dose group were given carbaryl at 20mg/kgbw, and the fourth high dose group were given carbaryl at 25mg/kgbw in the feed for 21 days. At the end of the experiment the lung of broiler chick were dissected out for further analysis. Lung after being removed from broiler chick were rinsed in saline solution for 2-3 times to remove any blood debris attached on the external surface. Then the lung tissue was cut into small pieces of approximately 4-5mm and was collected in formal saline solution. Paraffin embedded tissue was sectioned to 5μ thickness and stained by haematoxylin and eosin for histopathological examination.
OBSERVATION

Lung of control birds showed normal structure of alveolar ducts, respiratory bronchiole, alveolar sacs and trabeculae, which was influenced by the administration of different doses of carbaryl (Plate-1a). Following exposure to low dose (15mg/kg b.w.) there was congestion found in the lung of treated birds i.e. increased volume of blood within dilated vessels of a tissue. The bronchioles and the alveoli are filled with exudates consisting chiefly of blood cells (Plate-1b).

Birds exposed to intermediate dose (20mg/kg b.w.)(Plate-1c) and high dose (25mg/kg b.w.)(Plate-1d) showed mild congestion and pneumonitis in the lungs with increased volume of blood within dilated vessels and bronchioles and the alveoli are filled with exudates consisting chiefly of blood cells.

PLATE 1a: Section of lung tissue from control group Showing normal architecture. H×E, 100X.

PLATE 1b: Section of lung tissue from carbaryl (Low dose) administered broiler chicks Showing congestion with dilated vessels. HXE., 100X.

PLATE-1c: Section of lung tissue from carbaryl (Intermediate dose) administered broiler chicks showing mild congestion and pneumonitis. HXE, 100X.

PLATE-1d: Section of lung tissue from carbaryl (High dose) administered broiler chicks showing Congestion and pneumonitis. HXE, 100X.
DISCUSSION

Purohit (2005) who observed congestion in the lungs following oral administration of acephate in mice. Although the mechanism of pulmonary toxicity is poorly understood, it is reported that lung damaging processes depend on several endogenous factors, including lung cytokines (Witschi and Last, 1991). Cypermethrin that induces connective tissue proliferation in ovaries of rabbits (Ullah et al., 2006) and DDT which increases oocytes atresia in ovaries along with ovarian hypertrophy and decreased ovarian growth (Sibonani et al., 2009) are known to affect the ovary and reproductive hormones of animals. Gupta (1988) reported decline in the relative weight of the heart with histopathological alterations in cypermethrin intoxicated rats.

The gross lesions in the liver are in concurrence with the findings of Kaur et al. (1999) in goats and Mehta et al. (2003), Yadav et al. (2003) and Krishnamoorthy et al. (2007) in broiler chicks after administration of chlorpyriphos. Malik et al. (2002) reported perivascular and perineuronal oedema, gliosis and degeneration of a few neurons and Purkinje cells in broilers fed with chlorpyriphos. Histological examinations of the brains of poultry fed with different insecticides have revealed sporadic neurons containing double nuclei, suggesting enhancement in cell division by insecticides (Lakomy et al., 1984).

REFERENCES