ABSTRACT
THESIS ABSTRACT

Title of the thesis : "PATHOLOGICAL STUDIES IN EXPERIMENTAL MYCOTOXICOsis WITH REFERENCE TO ANTITOXIC EFFICACY OF A TOXIN BINDER IN BROILER"

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ABSTRACT

Present study was planned to evaluate the individual and combined toxicity of dietary aflatoxin B1 and ochratoxin A and antitoxic efficacy of a commercial toxin binder UTPP - Biotech in counteracting such adverse
effects in broilers. An experiment was conducted on two hundred and forty broiler chicks for a period of 42 days, which were divided into eight groups containing 30 chicks each. Control group was offered plain feed, treatment control group was fed plain feed mixed with UTPP Bioach @ 1.5 gm/kg of feed. Aflatoxicosis was induced by feeding aflatoxin @ 1.5 ppm, ochratoxicosis was induced by feeding ochratoxin A @ 1.5 ppm and combined toxicity was induced by combination of these two mycotoxins @ 0.75 ppm each in the diet. Additional three groups were kept out of which one was offered aflatoxin @ 1.5 ppm along with UTPP @ 1.5 gm/kg feed, second was offered ochratoxin @ 1.5 ppm along with UTPP @ 1.5 gm/kg feed and third was offered combined toxins (i.e. aflatoxin and ochratoxin) 0.75 ppm each along with UTPP @ 1.5 gm/kg feed.

Twenty eight field poultry feed samples were tested to know incidence of different mycotoxins in this area. Out of which 7 (25%) were found positive for aflatoxin, 5 (17.86%) for ochratoxin A and 1 (3.57%) for both these toxins.

Feed intake, body weight gain and feed conversion ratio, in chicks were computed at weekly intervals. Six chicks from each group were sacrificed fortnightly to record, organ weights, hematological and serobiochemical estimations and gross and histopathological findings.

In aflatoxin B, fed chicks there was significant reduction in feed intake, body weight gain, relative weights of heart, values of TSP, SA,
serum cholesterol, SUA, Hb, PCV, TEC and TLC. Whereas, significant increase in FCR, relative weights of liver, kidney, spleen, bursa, serum bilirubin, ALP and BCT was noted. Over all differential leucocyte counts of experimental birds remained unaltered.

In aflatoxic fed group grossly liver was enlarged, pale to yellowish in colour with necrotic patches on it. Kidneys were pale, yellow, mottled and slightly enlarged. Spleen was slightly congested with petechial haemorrhages. Bursa was atrophied with mild catarhal exudate. Heart was dilated at the end of experimental period. Lungs, brain and intestines were mild to severely congested. Microscopically, liver section showed granular and vacuolar degenerative changes, liver showed fatty necrobiotic and necrotic changes, ductular or acinar pattern of hepatocytes was noticed. Focal areas of lymphocytes infiltration and disorganization of hepatic parenchyma was also recorded. Kidneys showed granular, vacuolar degenerative changes and necrobiotic and necrosis. Mild to severe depopulation of lymphocytes in spleen, with thickening of splenic artery was observed. In bursa mild to severe depopulation of lymphocytes, interfollicular oedema and desquamation of bursal epithelial cells were seen. Brain showed mild to severe congestion with gliosis. Lungs were congested and oedematous. Intestines were congested. In heart Zenker's degeneration and interstitial oedema were evident.
In the birds fed aflatoxin B₁ along with UTPP Biotech toxin binder, significant increase in feed intake, body weight gain, values of TSP, SA, serum cholesterol, Hb, PCV, TEC and TLC were recorded whereas significant decrease in FCR, relative weights of liver, kidney, bursa, values of ALP and BCT as compared to aflatoxin fed group were recorded. Overall all differential leucocyte count in this group was remained unaltered. In birds fed aflatoxin along with UTPP toxin binder, the pathological lesions in different organs studied were less severe as compared to lesions observed in birds fed with aflatoxin alone.

In birds fed ochratoxin A significant increase in mean values of FCR, relative weights of kidney, spleen, serum uric acid, bilirubin, ALP and BCT were recorded whereas significant decrease in FI, BWG, relative weights of liver, spleen, heart, values of TSP, SA, cholesterol, values of Hb, PCV, TEC and TLC over control group were recorded. Over all relative weights of bursa and DLC were found unaltered throughout the experimental period.

In birds fed ochratoxin A, grossly, liver was slight pale with focal areas of necrosis. Kidneys were pale with focal areas of necrosis. At 28th and 42nd day interval kidney were enlarged and bulged out from lumbar fossa. Spleen, bursa and brain were slightly congested. Lungs and intestines were also congested throughout the experimental period. Microscopically, kidneys showed granular and vacuolar degeneration.
necrobiosis and necrosis in tubular epithelial cells. Increase cellularity in few glomeruli were seen. Heart, spleen and Bursa were congested. Lung were congested and oedematous. Intestines were congested and in few cases enteritis was noticed.

In birds fed ochratoxin A along with UTPP toxin binder, there was significant increase in the mean values of F1, BWG, relative weights of liver, serum cholesterol, Hb, PCV and TLC, whereas, significant reduction in the values of FCR, relative weights of kidney, values of SAU and BCT over the values in ochratoxin fed group were noted. Overall relative weights of bursa, spleen, heart, values of TSP, SA, SUA and bilirubin, TEC and DLC of this group remained unaltered throughout the experimental period. The pathological lesions in different organs studied in birds fed ochratoxin along with UTPP toxin binder were less severe as compared to lesions in ochratoxin fed group.

In birds fed aflatoxin B1 and ochratoxin A in combination there was significant increase in FCR, relative weights of bursa, values of serum uric acid, bilirubin, ALP and BCT values, whereas, significant reduction in values of F1, BWG, relative weights of liver, spleen, heart, values of TSP, SA, cholesterol, Hb, PCV, TEC and TLC over control group was recorded. Overall DLC values of birds of this group remained unaltered.

In birds fed with aflatoxin B1 and ochratoxin A in combination, grossly, liver was congested and enlarged with diffuse areas of necrosis.
Kidneys were congested and haemorrhagic. Bursa was atrophied and brain, lungs, spleen and intestines were congested. Microscopically the liver revealed diffuse granular and vacuolar degenerative changes. Necrobiosis and neotosis was also noticed in hepatocytes and at places lymphocytic aggregation were observed. Kidneys revealed acute cellular swelling in tubular epithelial cells. Focal areas of necrobiotic changes were observed. There were cystic spaces in renal section. In bursa minimal to mild depopulation of lymphocytes from bursal follicles and dematuration of bursal epithelium at places were observed. Severe congestion of microcapillaries was noticed. In spleen congestion and mild depopulation of lymphocytes were noticed. Intestines, lungs and heart showed congestion and oedema.

The birds fed aflatoxin B₁ and ochratoxin A along with UTPP toxin binder showed, significant increase in mean values of relative weights of liver, values of TSP, SA, serum cholesterol, Hb, PCV, TEC and TLC, whereas, significant reduction was recorded in values of FCR, relative weights of kidney, values of serum uric acid, bilirubin and BCT over combined toxin fed group. Overall feed intake, BWG, relative weights of bursa, spleen, heart, values ALP and DLC remained unaltered.