

Comparative Studies On Some Antimycotoxins In Chicken

Amer M. S., El-Sayed M. G. and Badr E. I. *

Pharmacology Department, Faculty of Veterinary Medicine, Mansoura University, Mansoura, EGYPT

* B.V.Sc., Mansoura University. Mansoura, EGYPT

ABSTRACT

A study was delineated to access the effects of antimycotoxin drugs Bomto form dry®, Muv-three stop® and MTB100® on chicken performance, some hematological, biochemical parameters and histopathological effects on some organs of the chicken. Four hundred apparently healthy one day old unsexed hubbard broiler chicks were used. The chicks were divided into four equals groups (100 chicks, group). The first one (G1) was kept as control, while the second (G2), third group (G3) and fourth group (G4) were given Bomto form dry, Muv -three stop and MTB 100 respectively in a dose one kilogram /ton ration (for each) all over the experiment.

The obtained results revealed that; G3 showed a slightly increase in mortality rate (%) compared with the other groups at 1st and 2nd week of age while G2 showed a noticeable decrease (0 %) in mortality % at the 3rd week compared with the other tested groups. Moreover, the mortality % was declined at the 4th week in all groups, specially in G2 and G4. At the 5th and 7th week, there were no recorded mortalities in all groups of experiment. Meanwhile at the 6th week, G4 recorded 1.9 % mortality compared with other tested groups.

Our data showed no significant changes in the body weight at 1st, 2nd, 3rd and 4th weeks of age in all groups. While at the 5th week our results reflect a significant increase in total body weight of G3 and a significant decrease of G4 compared with the other groups. At the 6th week a significant increase was recorded on total body weight of G3 compared with the other groups. Furthermore at the 7th week, there is a significant increase on body weight of G3 compared with G4.

The obtained data revealed a significant decrease in total erythrocytic count of all treated groups compared with the G1 at the 1st week, in G4 at 5th week and in G2 at 6th week post treatment. Moreover, a significant decrease on Hb concentrations was recorded in G4 at the 1st and 3rd week. Meanwhile, at the 3rd week, there is a noticeable alterations in Hb. concentration, where there is a significant increase in Hb. concentrations of G2 and a significant decrease in G3. At the 4th week, a significant decrease in Hb concentrations of G3 and in the G2 and G3 at the 6th and 7th weeks. A significant increase in coagulation time of G2 and G4 was recorded at 2nd and 3rd week also recorded in G2, only at 5th, 6th and 7th weeks while a significant decrease was recorded in G3 at 2nd and 5th weeks. The present study revealed a significant decrease in total leukocytic count of both G3 and G4 compared to G1.

Our results showed that, there is a significant increase on ALT of G3 and G4. with a significant increase on AST level of G4 at 7th week. Also a significant increase of Albumin of G2 with significant decrease of globulin level of G2 and G3 was recorded at 7th week. A significant increase of creatinine level of G3 and uric acid level of G3 and G4. The serum calcium and phosphorous levels showed a significant decrease of G3.

The livers of G2 showed congestion of the portal blood vessels while liver of G3 showing congested portal vein besides few inflammatory cells and hyper plasia of epithelial lining of bile duct were seen. The hepatocytes were focally replaced with round cells while that of G4 displayed the same changes besides extravasted erythrocytes. The kidney of G2 showed cloudy swelling of renal epithelium while that of G3 showed hypercellularity of glomeruli besides degenerative changes of renal epithelium also degenerative changes of renal epithelium besides round cells infiltration between renal tubules were observed in G4.

INTRODUCTION

Mycotoxicosis causes great problems in poultry farms. Aflatoxicosis, ochratoxicosis and trichothecene mycotoxicosis are the most commonly seen mycotoxicosis in poultry (1). Aflatoxicosis in broilers has acute toxic effect characterized by growth inhibition and inefficient feed conversion (2). A decrease in serum albumin has been reported as sensitive indicator to aflatoxicosis in poultry and animals (3).

Antimycotoxic agents are extensively used nowadays in poultry farms for protection and control of fungal growth and mycotoxicosis in poultry feed without being assured to their role in changing different body parameter and growth performance (4).

A number of approaches have been evaluated to deal with mycotoxins contaminated animals feeds. One of these approaches is the addition of absorbent materials to the diet. Absorbents have been used to alleviate the effects of aflatoxins in poultry diets (5). Also organic acids are known to be very effective against moulds and provide an efficient way to ensure the quality of stored feed (6).

The aim of this study was delineated to spot the light on comparative study the effect of three commercial antimycotoxic drugs on chicken performance, some haematological and biochemical parameters and to determine the histopathological reflections of their effect on some organs of the chicken.

MATERIAL AND METHODS

Drugs

1- Muv -Three -stop ®: Produced by Medical Professions for Veterinary Products and Fodders Additions Co (MUVCo), Cairo, Egypt.

2: MTB-100 (Alltech) ®: Produced by Alltech (inc303) Catnip Hill Pike Nieboissville kentacy 40356, South Africa.

3: Bomtoform dry ®: A free samples obtained from TEIBA Agri Vet .Co., Talkha ,

Dakahlia, Egypt. And produced by Pharma . Vet. International, Turkey.

Chicks

Four hundred apparently healthy one day old unsexed habard broiler chicks, were obtained from local commercial hatchery .They were fed on a balanced commercial ration free from any medications, obtained from Cairo Co. for poultry and ration. All hygenic measures were supplied as recommended .The chicks were floor reared in separate units along the experimental period .Water was provided at libitum . They were classified into four equal groups (each of 100 chicks).The first one (G1) kept as control , while the second (G2) , third (G3) and fourth (G4) groups were given Bomto farm dry , Muv three stop and MTB 100 respectively, in a dose of 1 kg /ton ration (for each)all over the experiment which lasted for seven weeks.

Experiment:

A – Mortality rate

The number of dead chicks in all groups was recorded and calculated as a percentage .

B – Growth rate study

(Body weight , body weight gain and gain percent)

The chicks of each group were individually weighted in the early morning before being fed using a sartorius digital balance prior to treatment and also weighed weekly at 1st , 2nd , 3rd , 4th , 5th , 6th and 7th week of age .The changes in body weight (in gm) were calculated and recorded .

Sampling

Blood samples were taken from all groups at end of each week post drug administration .Six birds from each group were slaughtered for collection of blood samples and each blood sample was divided into two portions. The first one was collected in a small labeled dry and clean vial containing heparin for haematological studies, while the second portion (about 2ml) was collected in

plain clean dry and sterile non heparinized centrifuge tubes of 10 ml capacity and left to be clotted. Then centrifuged at 3000 r.p.m for 15 minutes to separate clear serum. The obtained serum samples were collected and kept separately in clean dry tubes in deep freeze at -20C till used for biochemical analysis. A specimens from, liver, kidney and heart were collected at the last week and kept on 10 % formalin for histopathological examination.

Analysis

The whole blood samples were used for determination of haemoglobin (Hb) (7), total erythrocytic (R.B.Cs) and total leukocytic counts (W.B.C's) (8) and differential leukocytic count using Giemsa stained blood films (9).

The serum samples were assayed for total proteins and Albumin (10 & 11), uric acid (12), creatinine (13), alanine aminotransferase (ALT), aspartate aminotransferase (AST) (14), calcium (15), and phosphorus (16).

Statistical analysis

Statistical analysis was carried out (17), and using SPSS computer program (version 10.0.5.331, SPSS Inc company, Copyright © 1999).

RESULTS AND DISCUSSION

Effect on Mortality %

The obtained results revealed that; (G3) showed a slightly increase in mortality rate (%) compared with the other groups at 1st and 2nd week of age while Bonto form dry® treated group (G2) showed a noticeable decrease in mortality % at the 3rd week compared with the other tested groups. Moreover, the mortality % was declined at the 4th week in all groups, specially in G2 and G4 was recorded 1.3 % and 1.5 % respectively. At the 5th and 7th week, there were no recorded mortalities in all groups of experiment. Meanwhile at the 6th week, the MTB 100® treated group (G4) recorded a 1.9 % mortality compared with other groups (Table: 1). The high incidence of mortalities in 1st and 2nd week of age may be attributed to the presence

of many pathogens (e.g. E.coli, Salmonella, Mycoplasma ect.) at the early stage of age in the poultry farms and the absence of usual antibacterial supplementation in water to overcome any bacterial infections (18). Marked declined in mortality rate was recorded from the 3rd and 4th week of age in treated groups, especially G2 and G4 which may be attributed to the protective effect of the different constituents of the antimycotoxins on the intestinal pathogens (19). Addition of 5 % dietary hydrated sodium calcium aluminosilicate (HSCAS) resulted in a reduction of mortality % in turkey poult during aflatoxicosis (20).

Effect on body weight (gm).

Our data showed no significant changes in the body weight till the 4th weeks of age in all groups (Table: 2 & 3). Addition of HSCAS in mycotoxins free diet, did not have any significant effect on body weight, feed intake or feed conversion of poultry (21).

At the 5th week our results reflect a significant increase in total body weight of G3 and a significant decrease of G4 compared with the other groups. At the 6th week a significant increase was recorded on total body weight of G3 compared with the other groups. Furthermore at the 7th week, there was a significant increase on body weight of G3 compared with G4 (Table: 2 & 3). This result may be a reflection due to the presence of organic acids as a main constituent of Muv three stop compound. This suggestion is supported by the previously recorded results (22) which reported that, acetic acid and ammonium hydroxide improved by the weight gain, growth rate and feed conversion efficiency.

Effect on some haematological parameters

The obtained data revealed a significant decrease in total erythrocytic count of all treated groups compared with the control group at the 1st week post treatment. No significant change was observed on the total RBCs count at the 2nd, 3rd and 4th week between the different groups (Table: 4). Similar the addition of antimycotoxin HSCAS

to turkey diet poult (20) and Zoelites (23), did not alter the haematological values.

At the 5th week, a significant decrease in RBCs count was recorded in G4 compared with the other groups. Similarly at the 6th week, there was significant decrease in RBCs count of G2 compared with the other groups. While at the 7th week, there were no significant changes between different groups of experiment (Table. 4). This effect is consistent with that induced by formalin in cockerels (24).

A significant decrease on Hb concentrations in G4 at the 1st and 3rd week compared with other groups. Meanwhile at the 3rd week, there was a significant increase in Hb. concentrations of G2 and a significant decrease in G3 compared with other groups. At the 4th week, the result revealed a significant decrease in Hb concentrations of G3 compared with other groups. While at the 6th and 7th weeks there was a significant decrease in Hb. concentrations of G2 and G3 compared with the other two groups (Table. 4). A decrease in hemoglobin concentration and hematocrit in quails fed formalin (10 and 20 ml formalin /kg feed) was previously recorded (25). In contrast, found that, the addition of HSCAS to basal diet caused an increase in Hb, MCH and MCHC (21).

No significant changes were recorded between all tested groups on blood coagulation time at the 1st week. While in the 2nd week, there was a significant increase in coagulation time of G2 and G4, compared to control group. On the other hand, there was a significant decrease in G3 compared with control group. Similarly, at the 3rd week, there is a significant increase in coagulation time of G2 and G4 compared with the other two groups. While at the 4th week, there was no significant change in coagulation time between all tested groups. At the 5th week, our result, recorded a significant increase in coagulation time in G2. On the other hand, there was a significant decrease in G3. At the 6th and 7th weeks, our result recorded a significant increase in coagulation time of G2 compared with the other groups (Table. 4).

These variable results may be attributed to the different constituents in each antimycotoxin.

Total leukocytic count of both G3 and G4 was significant decreased compared to control group. On the other hand, a significant increase was recorded in G2 at 1st week. At the 2nd week, the result recorded a significant decrease in WBCs of G4 compared with G1. While at the 3rd week, there was a significant increase in WBCs of G2 compared with G1. At the 4th week, the obtained result showed a significant decrease in WBCs of G3 compared to that of G2. It was noticed that at the 5th week there was no significant change in WBCs count of all groups. While at the 6th and 7th weeks, there was a significant increase in WBCs of G2 compared with other tested groups (Table. 4). The significant decrease in WBCS count in G3 and G4 was similar to that induced by formalin in quails as mentioned by (25). Meanwhile, a significant increase in total WBCs count was recorded in G2 compared with the control group.

Regarding the differential leucocytic count our results didn't show any significant change in neutrophils % of all groups of the experiment at the 1st week. While at the 2nd week, there was a significant decrease in neutrophils % of G2, G3 and G4. Moreover, the result recorded a significant increase in neutrophils % of G3 at 3rd week. A similar result was recorded in G2 at the 4th week, where there is a significant increase in neutrophils %. On the other hand, the obtained data at the 5th week, showed a significant decrease in neutrophils % of G3 and G4. While at the 7th week, there is a significant increase in neutrophils % of G3 (Table. 4).

There was a significant lymphocytosis in G3 compared with the other tested groups at the 1st week. Also at the 2nd week, there is a significant lymphocytosis in the three treated groups. Meanwhile, there was a significant lymphocytopenia in G3 and G4 compared with the other two groups at the 3rd week. The result also recorded a significant lymphocytosis in G3 compared with the other tested groups at the 4th week. Meanwhile a there was a significant lymphocytopenia in G2

and G3 compared with the other two groups at the 5th week. At the 6th week, there is no significant change recorded between all groups. While at the 7th week, there was a significant lymphocytosis in G2 and G4 with a significant lymphocytopenia in G3 (Table. 4).

The effect of tested antimycotoxins on monocytes % of chicks revealed that, there was no significant change between all groups at 1st week and 3rd week. While at 2nd week, there was a significant decrease in monocytes % in all treated groups. At the 4th week, there was a significant decrease in monocytes % in all antimycotoxins treated groups compared with the control group. At the 5th and 6th weeks there was no significant change between all groups of the experiment. Meanwhile at the 7th week, there was a significant increase in monocytes % in G3 compared with the other tested groups (Table. 4). The obtained variable results reflected the effect of the tested antimycotoxins on the differential leukocytic count of the treated chicks, which also showed variable alterations in differential leukocytic count in all treated groups.

Effect on some serum biochemical parameters at the 7th week of experiment

A significant increase of ALT was recorded in and G4. Also this study clearly revealed a significant increase on AST level of G4 (Table. 5). Activated charcoal (200 ppm) induced a significant improvement in serum AST and alkaline phosphatase (26).

There was no significant change on total protein level at all experimented groups (Table. 5). Many authors recorded a similar findings induced by the use of different antimycotoxins as HSCAS (20) and Zeolites (23). The obtained data revealed a significant increase on Albumin of G2. On the other hand, there was a significant decrease in globulin level of G2 and G3 (Table. 5). Many other antimycotoxins were induced an alterations in the levels of albumin and globulin in serum of treated poultry (21, 25).

The effect of the tested antimycotoxins on the kidney function of the chicks clearly

showed a significant increase in creatinine level of G3 compared with G2 with no significant change in the other two groups. Moreover, there was a significant increase in uric acid level of G3 and G4 compared with the other two groups (Table. 5). The plasma uric acid was increased by propionate in either the feed or the water (24). Moreover, a significant increase in creatinine and uric acid concentrations were observed in birds fed high level of formalin (26).

The effect on calcium and phosphorous levels in serum of chicks were showed a significant decrease in calcium level of G3 (Table. 5). The addition of antimycotoxins, HSCAS, to the diet of broiler chicks and turkey poults reduced serum calcium level (21). While, there was a significant decrease on phosphorus level in G3 and G4. These findings were supported by many authors when studied the effect of different antimycotoxins in poultry. (27), were serum phosphorus concentration was reduced by 30 % in chicken fed sodium bentonite.

Histopathological findings at the 7th week

Liver

The livers of G2 showed congestion of the portal blood vessels (Fig.1A). Moreover, the liver of G3 showed congestion and grayish white foci on its surface. Microscopically congested portal vein besides few inflammatory cells and hyperplasia of epithelial lining of bile duct were seen (Fig.1 B). The hepatocytes were focally replaced with round cells. The liver of G4 showed similar macroscopic picture. Microscopically, the liver showed the same changes besides extravasted erythrocytes (Fig. 1C).

Heart

Macroscopically the heart of all groups appeared apparently normally. Microscopically mild congestion of coronary blood vessels was the only changes recorded in the three treated groups (Fig. 2).

Kidney

The kidney of G2 showed cloudy swelling of renal epithelium besides moderate

congestion of intertubular blood vessels (Fig. 3 A). The kidney of G3 chicks was dark red in colour. Microscopically, hypercellularity of glomeruli besides degenerative changes of renal epithelium were seen (Fig. 3 B). Moreover, focal replacement of renal parenchyma with round cells was seen.

Swollen pale kidneys were observed in G4 received. Microscopically, degenerative changes of renal epithelium besides round cells infiltration between renal tubes were observed (Fig.3 C).

These moderate alterations in all treated groups may be attributed to the effects

different constituent of each antimycotoxins used. A lesser degree of pathological changes in birds given formalin in their diet was cited (28).

On the other hand, the addition of clinoptilolite to the aflatoxin free diet did not produce a significant pathological changes compared with the control (6). Moreover, no significant microscopic lesions were detected in sections of liver, kidney, bursa, thymus, spleen or heart from chicks treated by HSCAS in ration (21, 24).

Table 1. Effect of the given Bomto -form dry® , Muv- three stop® and MTB 100®) at 1kg/ ton ration on Mortality % of chicks .

Group	Time	Mortality (%)						
		1 st week	2 nd week	3 rd week	4 th week	5 th week	6 th week	7 th week
G1 (non treated .control)		10	9	7.5	3.6	0	0	0
G2 (Bomto-form dry treated)		10	8.3	0	1.3	0	0	0
G3 (Muv -three stop treated)		12	10	6	3.5	0	0	0
G4 (MTB 100 treated)		10	9.2	2.8	1.5	0	1.9	0

Table 2. Effect of the given Bomto -form dry® , Muv- three stop® and MTB 100®) at 1kg/ ton ration on body weight (gm) of treated chicks . (M ± S.E) (n= 5)

Group	Time	Body weight (gm)							
		1 st day	1 st week	2 nd week	3 rd week	4 th week	5 th week	6 th week	7 th week
G1 (non treated .control)		43 ± 0.69 ^a	56 ± 2.06 ^a	70.8 ± 3.4 ^a	162.9 ± 4.2 ^a	389 ± 24.7 ^a	511 ± 16.7 ^a	681 ± 23.06 ^a	981 ± 24.2 ^{ab}
G2 (Bomto-form dry treated)		43.8 ± 0.64 ^a	56.5 ± 1.9 ^a	68.1 ± 3.08 ^a	168.9 ± 0.93 ^a	348 ± 20.5 ^a	500 ± 13.98 ^b	685 ± 29.2 ^b	990 ± 20.3 ^a
G3 (Muv -three stop treated)		42.9 ± 0.45 ^a	55 ± 1.84 ^a	67.1 ± 2.98 ^a	170.7 ± 1.9 ^a	386 ± 18.57 ^a	596 ± 31.6 ^b	780 ± 17.7 ^b	1037 ± 17.7 ^a
G4 (MTB 100 treated)		42.3 ± 0.33 ^a	56 ± 2.08 ^a	64.9 ± 3.28 ^a	167.7 ± 4.2 ^a	364 ± 24.4 ^a	439 ± 12.1 ^c	636 ± 28.6 ^{ac}	938 ± 14.8 ^b

The different letter in the same column means significant at (P>0.05) .

Table 3. The effect of the given Bomto-form dry®, Muv-three stop® and MTB 100® at 1kg /ton ration on body weight gain and gain percent of chicks .

Time (week)	G1 (non-treated control)		G2 (Bomto-form dry treated)		G3 (Muv-three stop)		G4 (MTB100 treated)	
	Gain	Gain %	Gain	Gain %	Gain	Gain %	Gain	Gain %
1 st	13	30.23	12.7	28.99	12.1	28.20	13.7	32.3
2 nd	14.8	26.42	11.6	20.53	12.1	22	8.9	15.8
3 rd	92.1	130.08	100.8	148	103.6	154.39	102.8	158.39
4 th	226.1	138.79	179.1	106.03	215.3	126.12	196.3	117.05
5 th	122	31.36	152	43.76	210	54.4	75	20.6
6 th	170	33.26	185	37	184	30.87	197	44.87
7 th	300	44.05	305	44.52	257	32.95	302	47.48

Table 4. Effect of the given Bomto-form dry®, Muv-three stop® and MTB 100® at 1kg /ton ration on some haematological parameters. (M± S.E) (n= 6)

parameter	Group	Time (Week)						
		1st	2nd	3rd	4th	5th	6th	7th
RBCs (10 ⁶ /mm ³)	G1	4.1 ± 0.17 ^a	3.87 ± 0.53 ^a	3.9 ± 0.33 ^a	3.5 ± 0.29 ^a	4.3 ± 0.16 ^a	4.4 ± 0.19 ^a	4.05 ± 0.23 ^a
	G2	3.85 ± 0.17 ^b	3.36 ± 0.23 ^a	3.8 ± 0.21 ^a	3.85 ± 0.3 ^a	4.02 ± 0.19 ^a	3.3 ± 0.23 ^b	4.02 ± 0.34 ^a
	G3	4.07 ± 0.44 ^{ab}	3.3 ± 0.31 ^a	4.05 ± 0.13 ^a	3.5 ± 0.16 ^a	4.1 ± 0.91 ^a	4.07 ± 0.11 ^a	3.9 ± 0.25 ^a
	G4	3.95 ± 0.34 ^b	3.6 ± 0.12 ^a	3.9 ± 0.27 ^a	3.6 ± 0.23 ^a	3.35 ± 0.23 ^b	3.9 ± 1.58 ^{ab}	3.9 ± 0.24 ^a
Hb. (gm)	G1	10.43 ± 0.23 ^a	9.3 ± 0.1 ^a	9.73 ± 0.14 ^a	9.36 ± 0.81 ^b	9.03 ± 0.46 ^a	9.06 ± 0.66 ^a	9 ± 0.11 ^a
	G2	9.9 ± 0.77 ^{bc}	10.76 ± 0.14 ^a	10.06 ± 0.66 ^b	8.5 ± 0.1 ^a	9.3 ± 0.37 ^a	8 ± 0.11 ^b	7.3 ± 0.26 ^b
	G3	9.76 ± 0.14 ^a	10.1 ± 0.75 ^c	9.13 ± 0.66 ^c	7.1 ± 0.7 ^b	8.63 ± 0.81 ^a	7.4 ± 0.30 ^b	7.83 ± 0.2 ^b
	G4	9.2 ± 0.6 ^d	8.2 ± 0.11 ^d	9.73 ± 0.66 ^{ad}	8.8 ± 0.52 ^b	9.33 ± 0.43 ^{ad}	9.6 ± 0.17 ^a	9.13 ± 0.17 ^a
Blood coagulation time	G1	24.3 ± 3.48 ^a	36.3 ± 0.66 ^a	45 ± 1.73 ^a	44.3 ± 2.3 ^a	48.3 ± 1.6 ^{ad}	51.6 ± 1.6 ^a	44.3 ± 2.3 ^a
	G2	20.6 ± 1.7 ^a	50.6 ± 0.66 ^b	52.3 ± 1.45 ^{ad}	51 ± 5.85 ^a	57.6 ± 1.45 ^b	78.3 ± 9.27 ^b	70 ± 7.63 ^b
	G3	23 ± 1.52 ^a	22.6 ± 3.9 ^c	48.3 ± 3.28 ^{ad}	42.3 ± 1.45 ^a	39.3 ± 2.96 ^c	50 ± 1.15 ^a	39 ± 2.08 ^a
	G4	23.6 ± 0.33 ^a	46.3 ± 0.6 ^b	56.3 ± 0.88 ^{bc}	53 ± 1.52 ^a	50.3 ± 1.45 ^d	48.3 ± 2.02 ^a	50.3 ± 3.17 ^a
WBCs (10 ³ /mm ³)	G1	10.66 ± 0.3 ^{abc}	11.66 ± 0.3 ^a	11.6 ± 0.6 ^a	14.3 ± 1.2 ^{ab}	11.66 ± 0.88 ^a	12 ± 0.57 ^a	11.6 ± 0.88 ^a
	G2	13 ± 1.52 ^a	10.6 ± 0.3 ^{ab}	14 ± 0.57 ^b	15.3 ± 0.33 ^a	11 ± 0.57 ^a	14.3 ± 0.3 ^b	14 ± 0.57 ^b
	G3	9.3 ± 0.3 ^b	10.3 ± 0.88 ^{ab}	10.3 ± 0.33 ^a	12.3 ± 1.1 ^b	12.0 ± 0.3 ^a	11.3 ± 0.3 ^a	11.3 ± 0.66 ^a
	G4	9.3 ± 0.3 ^{bc}	9.66 ± 0.33 ^b	10.3 ± 0.33 ^a	14.6 ± 0.33 ^b	12 ± 0.57 ^a	10.6 ± 0.66 ^a	10.3 ± 0.33 ^a
Neutrophils (%)	G1	30 ± 3.46 ^a	22 ± 1.15 ^a	22 ± 1.15 ^a	22 ± 1.15 ^b	19 ± 3.05 ^a	17.3 ± 4.45 ^a	16.6 ± 1.76 ^a
	G2	34 ± 1.15 ^a	16 ± 1.15 ^b	18.6 ± 2.4 ^a	43.3 ± 1.76 ^a	28.6 ± 2.4 ^b	14.6 ± 4.8 ^a	10.3 ± 3.52 ^a
	G3	28 ± 1.15 ^a	14 ± 1.15 ^b	42.6 ± 3.52 ^b	21.3 ± 1.76 ^b	14.3 ± 0.76 ^c	14.6 ± 0.76 ^a	24.6 ± 2.4 ^b
	G4	33.3 ± 1.76 ^a	15 ± 1.15 ^b	24 ± 2.30 ^a	22.6 ± 5.92 ^b	17.6 ± 0.66 ^a	14.8 ± 0.16 ^a	10.8 ± 0.4 ^a
Lymphocytes (%)	G1	53.3 ± 2.9 ^a	66 ± 1.15 ^a	70 ± 1.15 ^a	66 ± 1.15 ^b	71 ± 1.15 ^a	73.3 ± 5.81 ^a	75.3 ± 1.76 ^a
	G2	55 ± 1.15 ^a	70 ± 1.15 ^b	57 ± 1.15 ^a	48 ± 1.15 ^a	62 ± 1.15 ^b	72 ± 4.16 ^a	82 ± 1.15 ^b
	G3	60 ± 1.15 ^b	77.3 ± 1.76 ^b	39.3 ± 0.76 ^b	71 ± 1.15 ^c	69.3 ± 1.76 ^c	78 ± 1.15 ^a	61.3 ± 0.66 ^c
	G4	56 ± 1.15 ^a	78.3 ± 4.66 ^b	60 ± 1.15 ^c	68.6 ± 2.9 ^{bc}	70.6 ± 1.76 ^a	74.6 ± 2.9 ^a	80.6 ± 3.52 ^b
Monocytes (%)	G1	9 ± 1.15 ^a	10 ± 1.15 ^a	6.66 ± 0.66 ^a	10 ± 1.15 ^a	8.6 ± 2.40 ^a	6.4 ± 1.15 ^a	6.6 ± 0.66 ^{ab}
	G2	10 ± 1.15 ^a	6 ± 1.15 ^b	7 ± 1.15 ^a	6 ± 1.15 ^b	8 ± 1.15 ^a	6 ± 1.15 ^a	6 ± 0.23 ^{ab}
	G3	10 ± 1.15 ^a	6 ± 1.15 ^b	8 ± 1.15 ^a	6 ± 1.15 ^b	10 ± 3.46 ^a	6.6 ± 1.76 ^a	10 ± 1.15 ^a
	G4	8 ± 1.15 ^a	5.33 ± 0.66 ^b	5.3 ± 0.66 ^a	4.6 ± 1.76 ^b	7.33 ± 1.76 ^a	4.66 ± 0.66 ^a	4 ± 0.2 ^b

The different letter in the same column means significant at $P > 0.05$.

Table 5. The effect of the given Bomto -form dry ® , Muv- three stop ® and MTB 100 ® at 1kg/ton ration on serum biochemical parameters of chicks at the 7th week of age. (M± S.E) (n= 6)

Parameter \ Group	G1 (non treated control)	G2 (Bomto-form dry treated)	G3 (Muv-three stop treated)	G4 (MTB 100 treated)
ALT (u/ml)	10.0 ± 0.70 ^a	11.0 ± 0.71 ^a	16.8 ± 0.96 ^b	18.0 ± 1.58 ^b
AST (u/ml)	59.6 ± 1.568 ^a	63.8 ± 1.77 ^a	64.8 ± 2.74 ^a	73.4 ± 3.07 ^b
T. Protein (gm/100ml)	2.96 ± 0.56 ^a	3.11 ± 0.11 ^a	2.97 ± 0.25 ^a	3.16 ± 0.04 ^a
Albumin (gm/100 ml)	1.03 ± 0.07 ^b	1.29 ± 0.10 ^a	1.18 ± 0.11 ^{ab}	1.1 ± 0.04 ^b
Globulin (gm/100 ml)	1.93 ± 0.04 ^a	1.82 ± 0.01 ^b	1.79 ± 0.1 ^b	2.06 ± 0.01 ^{ac}
Creatinine (mg /100 ml)	0.71 ± 0.08 ^{ab}	0.65 ± 0.05 ^a	0.81 ± 0.09 ^b	0.70 ± 0.04 ^{ab}
Uric acid (mg /100ml)	2.51 ± 0.22 ^a	2.84 ± 0.21 ^b	3.62 ± 0.31 ^c	3.12 ± 0.11 ^{abc}
Calcium (mg /100 ml)	8.94 ± 0.18 ^b	8.95 ± 0.06 ^b	7.74 ± 0.15 ^a	8.74 ± 0.13 ^b
Phosphores (mg /100 ml)	5.15 ± 0.06 ^a	5.04 ± 0.09 ^{ac}	4.14 ± 0.16 ^b	4.78 ± 0.13 ^c

The different letter at the same column means significant at $P > 0.05$

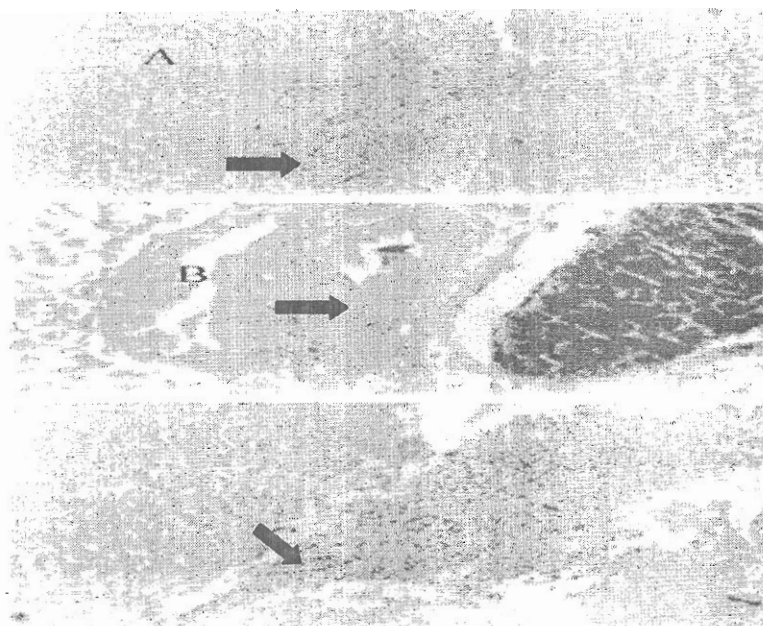


Fig 1. Section in liver showing congested congestion of portal hepatic blood vessels (A), portal vein with few inflammatory cells and hyperplasia of epithelial lining of bile duct (B) and haemorrhage , focal replacement of hepatocyte by round cells and extravasated erythrocytes (C) (H&E)

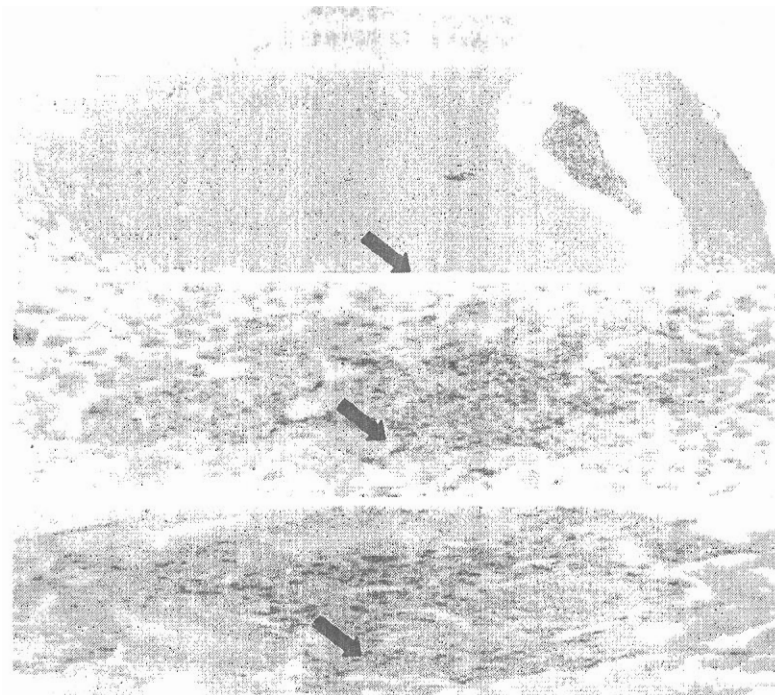


Fig 2. Section in heart showing slight congestion of coronary blood vessels (A), congestion of coronary blood vessels (B) and slight congestion of coronary blood vessels (H&E) (C)

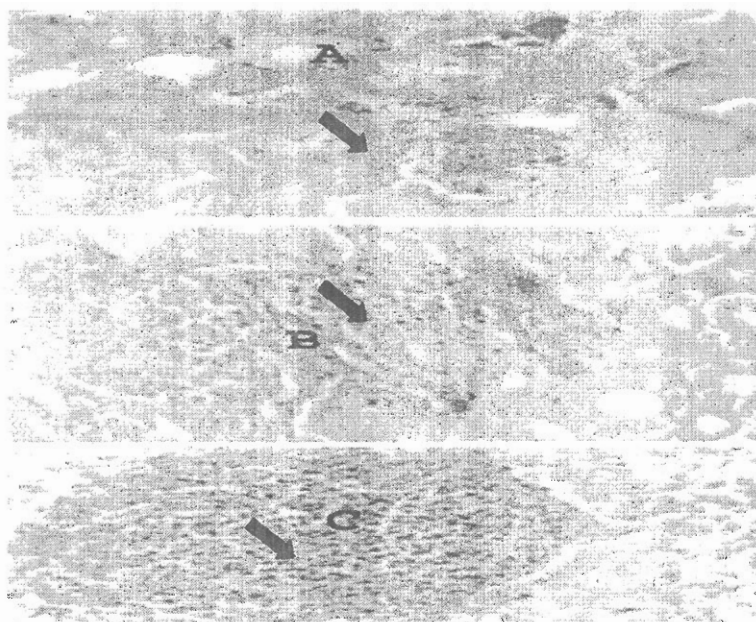


Fig 3. Section in kidney showing cloudy swelling of renal epithelium and intertubular blood vessels showed moderate congestion (A), hypercellularity of glomeruli with degenerative changes in renal epithelium (B) and round cells infiltration between renal tubules and the latter showed degenerative changes and few necrotic cells (H&E) (C)

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الملخص العربي

دراسات مقارنة على بعض مضادات السموم الفطرية في الدجاج

مجدي صلاح عامر و محمد جبر السيد و إيهاب إبراهيم بدر*

قسم الأدوية كلية الطب البيطري جامعة المنصورة

بكالوريوس طب بيطري جامعة المنصورة*

وقد أجريت هذه التجربة على عدد 400 كتكوت سليم غير مصاب من سلالة هابر د عمر يوم واحد غير مجنس وذلك لدراسة تأثيرات بعض مضادات السموم الفطرية مثل بومتوفورم دراى ، موف ثرى ستوب ، إم تى بى 100 على معدل الزيادة فى الوزن وأيضاً تأثيرها على صورة الدم وتأثيرها على وظائف الكبد والكلية ونسبة الكالسيوم والفوسفور وأيضاً تأثيرها الهستوباثولوجى لأنسجة بعض الأعضاء (الكبد - الكلية - القلب) وقد قسمت هذه الكتاكيت إلى أربع مجموعات متساوية. المجموعة الأولى : مجموعة ضابطة غير معدة أو معالجة أما المجموعة الثانية فقد تم إضافة بومتوفورم دراى فى العليقة (1 جم / 1 كجم) وفى المجموعة الثالثة تم إضافة موف ثرى ستوب فى العليقة (1 جم / 1 كجم) وفى المجموعة الرابعة مجموعة غير معدة وتعطى إم تى بى 100 فى العليقة (1 جم / 1 كجم) . تم أخذ عينات دم و مصل من كل مجموعة (ستة كتاكيت) بعد نهاية كل أسبوع وكذلك تم تجميع بعض الأعضاء منها الكبد والكلية والقلب وذلك لفحصها وإجراء دراسات هستوباثولوجية عليها.

ومن النتائج أتضح أن المجموعة الثالثة التى تستخدم موف ثرى ستوب قد زاد معدل الوفيات فيها فى الأسبوعين الأول والثانى بالمقارنة بالمجموعات الأخرى وخاصة المجموعة الثانية التى تستخدم بومتوفارم دراى كانت أقل فى معدل النافق فى الأسبوع الأول والثانى والرابع وأيضاً السادس بالمقارنة بباقي المجموعات .

قد أوضحت الدراسة أنه لا يوجد فرق ملحوظ بين الأربعة المجاميع فى معدل الزيادة فى وزن الكتاكيت فى الأسبوع الأول والثانى والثالث والرابع أما فى الأسبوع الخامس فلو حظ زيادة فى الوزن فى المجموعة الثالثة (موف ثرى ستوب) وقلة

فى الوزن فى المجموعة الرابعة بالمقارنة بالمجموعتين الباقيتين وأيضاً وجد زيادة فى المجموعة الثالثة فى الأسبوعين السادس والسابع بالمقارنة بباقي المجموعات .

ولقد تبين حدوث إنخفاض معنوى فى عدد كرات الدم الحمراء فى المجموعات التى أعطيت مضادات سموم فطرية بالمقارنة بالمجموعة الأولى التى لم تعامل بمضادات السموم الفطرية فى الأسبوع الأول . أما فى الأسبوع الخامس والسادس لوحظ هذا الانخفاض فى المجموعة الرابعة . كما تبين أنه يوجد انخفاض معنوى فى نسبة الهيموجلوبين فى المجموعة الرابعة فى الأسبوع الأول والثانى أما فى الأسبوع الثالث قد بينت الدراسة أنه يوجد زيادة ملحوظة فى نسبة الهيموجلوبين فى المجموعة الثانية . كما تبين أنه يوجد انخفاض معنوى فى نسبة الهيموجلوبين فى المجموعة الثالثة فى الأسبوع الرابع والسادس . أما فى الأسبوع الثانى فقد وجد زيادة ملحوظة فى وقت تجلط الدم فى المجموعة الثانية والمجموعة الرابعة . على النقيض يوجد إنخفاض ملحوظ فى وقت تجلط الدم فى المجموعة الثالثة بالمقارنة بالمجموعة الأولى أيضاً قد أوضحت الدراسة أنه يوجد زيادة ملحوظة فى وقت تجلط الدم فى المجموعة الثانية عند الأسبوع الخامس والسادس والسابع . كذلك وجد انخفاض معنوياً فى عدد كرات الدم البيضاء فى المجموعة الثالثة والمجموعة الرابعة . على النقيض وجد زيادة فى عدد كرات الدم البيضاء فى المجموعة الثانية فى الأسبوع الأول . أما فى الأسبوع الثانى قد تبين أنه يوجد إنخفاض ملحوظ فى عدد كرات الدم البيضاء فى المجموعة الرابعة . وعند الأسبوع الرابع والسادس والسابع وجد زيادة ملحوظة فى عدد كرات الدم البيضاء فى نفس المجموعة .

أوضحت النتائج المسجلة أنه يوجد زيادة ملحوظة فى إنزيم الألانين أمينو ترانسفيريز فى المجموعتين الثالثة والرابعة مقارنة بالمجموعتين الأخرتين . وأيضاً وجد زيادة ملحوظة فى إنزيم اسبرتيت أمينو ترانسفيريز فى المجموعة الرابعة . أما بالنسبة لمستوى بروتين الدم فقد وجد أنه لا يوجد اختلاف ملحوظ بين كل مجموعات الدراسة على العكس من الألبومين فقد وجد أنه قد زاد فى المجموعة الثانية مقارنة بباقي مجموعات التجربة . أما مستوى الجلوبيولين فقد انخفض فى المجموعتين الثانية والثالثة مقارنة بباقي المجموعات . بالنسبة لمستوى الكرياتينين فى السيرم وجد أنه قد زاد فى المجموعة مقارنة بالمجموعة الثانية وأنه لا يوجد اختلاف ملحوظ فى المجموعتين الأخرتين . أما بالنسبة لحمض البوليك فقد زاد فى المجموعتين الثالثة والرابعة . ولقد وضحت الدراسة تأثير السموم الفطرية المستخدمة فى التجربة على نسبة الكالسيوم فى السيرم فقد وجد أن مستوى الكالسيوم و الفوسفور قد إنخفض فى المجموعة الثالثة .

أوضحت الدراسة أن التأثيرات المرضية (الهسوباتولوجية) لمضادات السموم الفطرية المستخدمة هى فى الكبد كالآتى احتقان فى الأوعية الدموية الكبدية فى المجموعة الثانية (وأيضاً فى المجموعة الثالثة وجد احتقان فى الأوعية الدموية الكبدية وبعض من الخلايا الملتهبة وزيادة فى الغشاء المبطن للقناة المرارية أما فى المجموعة الرابعة فقد شهدت نفس التغييرات إضافة إلى وجود بعض من كرات الدم الحمراء خارج الأوعية الدموية الكبدية . أما فى الكلى ففى المجموعة الثانية فقد وجد احتقان فى الأوعية الدموية بين الأنبوبية . أيضاً فى المجموعة الثالثة فقد وجد زيادة فى عدد خلايا جلوميرولاي وبعض التحلل فى أنسجة الكلى وأضاف إلى ذلك قد استبدلت أنسجة الكلى بخلايا دائرية . أما فى المجموعة الرابعة وقد وجد تحلل فى أنسجة الكلى وأيضاً وجود عدد كبير من الخلايا الدائرية بين الأنوبات .