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SUMMARY

Poultry breeding has an economical importance as poultry is considered a good source of animal protein all over the world. The present study was conducted to evaluate the efficacy of allopurinol 40 mg/kg.B.wt and/or dl-methionine 6g/kg.feed on experimentally affected chickens with visceral gout caused by sodium bicarbonate for controlling of such affection and that by studying clinical symptoms , mortality rate , lesion scores, body weight, hematological studies, effect on serum biochemical parameters and histopathological studies.

Experimental design:

Two hundred one day old Hubbard chicks were used in this study. Chicks were divided into 9 groups each of 20 except third group it was 40 chicks and chicks had been divided as follow:

1st group: received no treatment and was considered as control.

2nd group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 3 successive days.

3rd group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 10 successive days.

4th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 3 successive days, then treated with allopurinol (40 mg/kg b.wt) in ration for 7 successive days.

5th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 3 successive days, then treated with DL-methionine (6 g/kg diet) in ration for 7 successive days.

6th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 3 successive days, then treated with a combination of allopurinol (20 mg/kg b.wt) and DL – methionine (3 g/kg diet) in ration for 7 successive days.

7th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 10 successive days and treated at the same time with allopurinol (40 mg/kg b.wt) in ration for 10 successive days.

8th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 10 successive days and treated at the same time with dl-methionine (6 g/kg diet) in ration for 10 successive days.

9th group: received sodium bicarbonate (SB) in drinking water (20gm/L) for 10 successive days and treated at the same time with both allopurinol (20 mg/kg b.wt) and dl-methionine (3 g /kg diet) in ration for 10 successive days.

Blood samples were taken on 1st, 7th and 14th day post treatment for hematological studies and another blood samples were collected to separate serum for investigation of liver and kidney functions. Kidney, liver, lung and heart specimens were collected in formalin 10% for histopathological examination.

1) Effect on clinical symptoms:

- All birds of control group (non affected – non treated) and non affected were healthy and showing no clinical symptoms throughout the experimental period.
- Birds experimentally affected with visceral gout and none treated showed clinical symptoms such as depression, anorexia, and increase water intake while their feed intake was decreased and presented watery diarrhea.

- Affected birds, medicated with allopurinol or dl- methionine or combination of half therapeutic dose of both drugs showed less degree of clinical symptoms comparing with affected non treated chicks.

2) Effect on the mortality rate:

The mortality rate was zero in non infected non treated group. Experimental affection with visceral gout (chickens exposed to sodium bicarbonate 2% for 10 days) induced 40% , whereas the mortality rate reduced to 20% in group affected with visceral gout by exposure to sodium bicarbonate for 3 days and this percent reduced to 5% in groups exposed to sodium bicarbonate 2%for 3 days and then treated with allopurinol or treated with a combination of half therapeutic dose of allopurinol and dl-methionine, while groups that exposed to sodium bicarbonate 2% for 3 days and then treated with dl-methionine and that exposed to sodium bicarbonate 2% for 10 days and at the same time with a combination of half therapeutic dose of allopurinol and dl-methionine or with allopurinol alone produced mortality rate (10%). Group that exposed to sodium bicarbonate 2% for 10 days and at the same time treated with dl-methionine produced mortality rate (15%).

3) Effect on lesion scores:

- All chicks of the non affected non treated (control) group were apparently normal and revealed no lesions in different organs.
- Chickens experimentally affected with visceral gout and non medicated were emaciated, they showed white chalk- like deposits covering the surface of various abdominal organs as well as the heart. Kidneys were pale, irregular and with excessive enlargement of lobules .Ureters were distended with urates.
- Affected birds (received SB 2 % in water for 10 days) and at the same time medicated with allopurinol or dl- methionine or

combination of half therapeutic dose of both drugs revealed less gross lesions than affected non treated group.

- Affected birds (received SB 2 % in water for 3 days) and then medicated with allopurinol or dl- methionine or combination of half therapeutic dose of both drugs revealed no gross lesions in different organs.

4) Effect on body weight:

- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked a significant decrease in body weight on 1st 7th and 14th days post treatment when compared with non affected non treated group.
- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurinol and / or dl-methionine showed a great improvement in body weight .

5) Effect on hematological picture:

- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked significant changes in erythrocyte count, packed cell volume and hemoglobin concentration, blood pH.
- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurinol and / or dl-methionine showed a great improvement in erythrocyte count, packed cell volume and hemoglobin concentration blood pH.

- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate 2% for 10 successive days in drinking water) and at the same time treated with allopurinol and / or dl- methionine showed mild improvement in erythrocyte count, packed cell volume and hemoglobin concentration blood pH.

6) Effect on serum biochemical parameters:

- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked significant increase in uric acid and creatinine levels compared with non affected non treated groups.
- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurinol and / or dl-methionine showed a great improvement in uric acid and creatinine levels .
- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked significant changes in sodium, potassium and chloride levels compared with non affected non treated groups
- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurinol and / or dl -methionine showed a great improvement in sodium, potassium and chloride levels .
- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked

significant increase in AST, ALT, ALP activities compared with non affected non treated groups.

- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurionl and / or dl -methionine showed a great improvement in AST, ALT, ALP activities.
- Chickens experimentally affected with visceral gout (exposed to sodium bicarbonate for 3 and for 10 days in drinking water) evoked significant changes in total protein, albumin, and globulin levels compared with non affected non treated groups.
- The experimentally affected chickens with visceral gout (exposed to sodium bicarbonate 2% for 3 days in drinking water)and then treated with allopurionl and / or dl -methionine showed a great improvement in total protein, albumin, globulin levels.

7. Histopathological findings:

- Chickens experimentally affected with visceral gout demonstrated severe renal, cardiac, hepatic and lung lesions. Chickens experimentally affected with visceral gout and treated with allopurinol and / or dl-methionine showed mild degenerative changes with normal appearance for most hepatic, renal, cardiac and lung structures.

CONCLUSION

From the present study it could be concluded that, visceral gout is a disease facing poultry industry caused by excessive use of sodium bicarbonate.

It was found that visceral gout resulted in harmful effects which lead to decline in productivity of broiler chickens.

Administration of therapeutic doses of allopurinol and /or dl-methionine had a potent value in the treatment of such affection and more favorable outcomes were achieved after removing the cause of visceral gout.