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Drug Interaction of Using Some Anticoccidial drugs in Chicken

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SUMMARY

Coccidiosis is one of the most dangerous parasitic diseases that affect poultry. It causes great economic losses due to deterioration of performance rates in infected chickens, which adversely affects the poultry industry. *Eimeria tenella* is one of the most pathogenic species of genus *Eimeria* the main cause of cecal coccidiosis which remains one of the most commonly reported diseases in chickens.

This study was carried out to test the interaction between Toltrazuril and Sulfaclozine sodium when they are used on experimentally infected chickens with *E. tenella* in order to achieve the optimal control to cecal coccidiosis. Their efficacy was evaluated the on clinical signs, oocyst counting, lesion scoring, mortality rate and to monitor their effect on body performance, hematological and biochemical parameters and histopathological changes.

In the present work one hundred and twenty, one day-old unsexed Erbo plus broiler chicks were randomly divided into equal 8 groups each of 15 chicks. All were fed on ordinary ration free from any anticoccidial drugs all over the experiment (37 days).

Group 1: Kept non-infected, non-treated and served as the negative control group.

Group 2: Non-infected, treated with recommended dose of Toltrazuril (1cm/litre) administered for 3 successive days beginning from 20th day to 22nd day of age.

Group 3: Non infected, treated with recommended dose of Sulfaclozine sodium (2gm/litre) given for 3 successive days beginning from 20th day to 22nd day of age.

Group 4: Non-infected, treated with recommended dose of Toltrazuril (1cm/litre) + Sulfaclozine sodium (2gm/litre) administered for 3 successive days beginning from 20th day to 22nd day of age.

Group 5: Infected with *E. tenella* (50.000 oocyst / bird) on 15 days of age, non-treated and kept as control positive group.

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Group 6: Infected with *E. tenella* (50.000 oocyst / bird) on 15 days of age and treated with recommended dose of Toltrazuril (1cm/litre) administered after the symptoms of infection had appeared (on 5th day of infection) for 3 successive days beginning from 20th day to 22nd day of age.

Group 7: Infected with *E. tenella* (50.000 oocyst / bird) on 15 day of age and treated with recommended dose of Sulfaclozine sodium (2gm/litre) administered after the symptoms of infection had appeared (on 5th day of infection) for 3 successive days beginning from 20th day to 22nd days of age.

Group 8: Infected with *E. tenella* (50.000 oocyst / bird) on 15 days of age and treated with recommended dose of Toltrazuril (1cm/litre) + Sulfaclozine sodium (2gm/litre) administered after the symptoms of infection had appeared (on the 5th day of infection) for 3 successive days beginning from 20th days to 22nd days of age.

The efficacy of Toltrazuril, Sulfaclozine sodium either alone or in combination was based on clinical signs, mortality rate, oocyst counting, lesion scoring, growth performance, hematological, biochemical parameters and histopathological changes.

The obtained main results are summarized as follows:

- ❖ The infected non-treated group (G5) showed the typical signs of coccidiosis including depression, dehydration, loss of appetite and bloody droppings through one week post infection. Variable degrees of illness were recorded until the end of experiment. The medicated group by Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8) improved the clinical signs and restore the bird's activity. Moreover, the mortality % in G5 was 33.33 % and it was reduced to 13.33 % in G7, with no mortality was observed in G6, G8. Non infected treated group by Toltrazuril (G2), Sulfaclozine sodium (G3) and drugs combination (G4) did not show any significant difference when compared to non-infected non-treated group (G1).

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- ❖ The infected non-treated control group (G5) showed the highest oocyst counting which reached its maximum count on the 7th day post infection. This highest oocyst counting was significantly decreased after treatment with Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8). On the other hand, the caeca of the infected non treated group (G5) showed the highest lesion scores which ranged from +3 to +4. The lesion scores were improved by all drugs treatments and ranged from +1 to +2 in infected group treated with Sulfaclozine sodium alone (G7), from 0 to +1 in infected group treated with Toltrazuril alone (G6) and infected group treated with both drugs together (G8).
- ❖ The infected non-treated group (G5) showed a significant decrease in the body weight gain with poor feed conversion ratio. Moreover, there was a significant improvement in these growth performance parameters in the medicated group by Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8) as compared with infected non treated group. On the other hand, no significant differences in performance parameters were recorded between non infected treated groups with Toltrazuril (G2) and Sulfaclozine sodium (G3) each alone or in combination (G4) compared with negative control (G1).
- ❖ The infected non treated group (G5) showed a significant drop in RBCs count, Hb content and PCV% as compared to the control group (G1). This decreased parameters were significantly increased after treatment with Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8). On the other hand, no significant differences were observed in non-infected treated groups (G2, G3 and G4) when compared with control group (G1).
- ❖ The infected non treated group (G5) showed a significant increase in total WBCs count, lymphocytes, heterophils, monocytes, and eosinophils counts as compared to the control group (G1). This increased parameters were

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- significantly decreased after treatment with Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8). On the other hand, no significant changes were observed in non-infected treated groups (G2, G3, and G4) when compared with control group (G1).
- ❖ The infected non treated group (G5) showed a significant decrease in the total serum protein, albumin, globulins and a significant higher serum level of liver damage enzymes (AST, ALT and ALP) and kidney damage parameters (creatinine and uric acid) as compared to the control group (G1). Infected groups treated by Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8) elicited a significant increase in total serum protein, serum albumin, globulins, a significant decrease in serum activities of AST, ALT, ALP, serum uric acid and creatinine. On the other hand, non-infected treated groups (G2, G3, and G4) showed slight significant differences when compared with control group (G1).
 - ❖ Histopathological examination of the cecum of infected non treated group cecum (G5) showed necrotic enteritis associated with partial or complete sloughing of mucosa, most of intestinal glands showed presence of coccidial schizonts, some of parasitic stages were extended to the muscle layer associated with extensive necrosis, inflammation and marked inflammatory cells infiltrated such as heterophils, eosinophils and mononuclear cells. Moreover, infected group treated with Toltrazuril (G6) revealed marked decrease of the necrotic lesion accompanied with decrease the parasitic stages within lining mucosa and hyperplastic regenerative changes were seen within the mucosal lining. Similarly, infected group treated with Sulfaclozine sodium (G7) showed decrease the parasitic stages and necrotic enteritis but with lesser degree than G6. However infected group treated with Toltrazuril +Sulfaclozine sodium (G8) showed marked decrease of parasitic stages, mild degenerative and hyperplastic changes within the mucosa. The liver of infected non treated group (G5) revealed multifocal periportal inflammation

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consisted of mononuclear cell infiltration mixed with eosinophils with a lower degree in infected groups treated Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8). The kidney of infected non treated group (G5) demonstrated coagulative necrosis of the renal tubules. Moreover infected groups treated by Toltrazuril (G6) and Sulfaclozine sodium (G7) each alone or in combination (G8) showed some degenerative changes within the renal tubules such as vacuolation within the renal tubules, myelin membrane on the renal tubules epithelial lining and hyaline casts were detected in a lower degree than infected non treated group. On the other hand, no significant pathological lesions were observed in the cecum, liver or kidney of non-infected treated groups in comparison with the non-infected non-treated control group.