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SUMMARY

Danofloxacin is recent antibacterial agent belong to the fluoro-quinolone family and is active against Gram-ve enterobacteria species. Ceftiofur sodium is a third-generation cephalosporin against Gram-ve and Gram+ ve and anaerobic pathogens.

E.coli infection in chickens has been in the last decade a major problem in poultryfarms all over the world.

The present study was performed to investigate the effect of danofloxacin (5mg /kg b. wt in drinking water) or ceftiofur sodium (2mg/ kg b. wt s/c) for three successive days on treatment of infected chicks with E.coli as well as on haemogram and some biochemical parameter.

I-Antibacterial activity in vitro:

The present investigation showed that MIC of danofloxacin was 0.6 µg/ml against E.coli and MIC of ceftiofur sodium was 0.2 µg/ml against E.coli .

Sensitivity of E.coli pathogenic strains of avian origin to commercial discs namely danofloxacin, ceftiofur sodium , enrofloxacin, gentamicin, oxytetracyclin, chloramphenicol, ciprofloxacin, suphonamide with trimethoprime were measured. The results revealed that E.coli pathogenic strains of avian origin were highly sensitive to danofloxacin and ceftiofur sodium than other tested antimicrobials.

II – Antibacterial activity in vivo:

A total number of 120 one day old chicks were classified into 6 equal groups, each of 20 chicks

1st group Non-infected non treated (Healthy control)

2nd group Non-infected treated with danofloxacin (5mg /kg b. wt in drinking water) for three successive days

3rd group Non-infected treated with ceftiofur sodium (2mg/ kg b. wt s/c) for three successive days

4th group Infected non treated (Infected control)

5th group Infected treated with treated with danofloxacin (5mg /kg b. wt in drinking water) for three successive days

6th group Infected treated with ceftiofur sodium (2mg/ kg b. wt s/c) for three successive days

Blood samples were taken at the end of 1st day, 7th day and 14th post-treatment for haematological studies and another blood samples were collected to separate serum for investigation of some biochemical parameters.

1-Clinical symptoms:

Normal chicks (non-infected non treated) and also infected treated with danofloxacin or ceftiofur sodium were healthy, viable showing no clinical symptoms along the course of the experiment. Whereas E.coli infected and non-medicated group displayed clinical symptoms such as: loss of appetite, diarrhea, depression, ruffled feathers, debility, dropped head, coughing , respiratory symptoms including sneezing, gasping, mouth breathing, rales, nasal discharge.

Administration of danofloxacin or ceftiofur sodium to E.coli infected broiler chicks improved disease symptoms and completely disappeared at 7th day post treatment.

2- Mortality rate:

The mortality rate was zero in the groups non infected medicated with danofloxacin or ceftiofur sodium and group non infected non treated.

Experimental infection with E.coli evoked high mortality rate (25 %) whereas group infected with E.coli medicated with danofloxacin or ceftiofur sodium reduced the mortality rate to 5 %.

3- Lesion scores:

Non-infected chickens and treated with danofloxacin or ceftiofur sodium showed no gross pathological lesions. Most infected non-treated chickens revealed severe gross pathological lesions such as pericarditis, perihepatitis, air saculitis, and enteritis. All infected groups and medicated with danofloxacin or ceftiofur sodium showed low percentage of gross lesions. Danofloxacin or ceftiofur sodium were highly effective in control of these lesions throughout the experimental period.

4- Body weight and body weight gain:

The groups non-infected and treated with danofloxacin or ceftiofur sodium showed a significant increase in body weight. The groups infected with E.coli and non treated with danofloxacin or ceftiofur sodium evoked a significant decrease in the body weight. Medication of E.coli infected chickens with danofloxacin or ceftiofur sodium showed a significant improvement in the body weight

5-Effect on food consumption and feed conversion ratio:

The group non-infected treated with danofloxacin or ceftiofur sodium showed an increase in food consumption and feed conversion ratio when compared with control group. The chickens experimentally infected with E.coli and non medicated showed a decrease in food consumption and feed conversion ratio when compared with control group. Medication of E.coli infected chickens with danofloxacin or ceftiofur sodium produced increase

in food consumption and food conversion ratio when compared with infected control group.

III-**Haematological picture:**

The groups non infected and treated with danofloxacin or ceftiofur sodium for three successive days revealed a significant decrease in erythrocyte count, haemoglobin concentration, packed cell volume with a significant increase in WBCs count all over the experimental period. Infection of chickens with E.coli evoked a significant decrease in RBCs count, Hb concentration and PCV% with a significant increase in leucocytic count. Treatment of E.coli infected birds with danofloxacin or ceftiofur sodium afforded a significant increase in RBCs count, Hb concentration and PCV% with a significant decrease in leucocytic count compared with infected non-treated group.

IV. Serum biochemical parameters:

1- Liver enzymes:

Groups non-infected treated with danofloxacin or ceftiofur sodium elicited a significant increase in AST, ALT, and ALP activities post treatment all over the experimental period. The groups infected with E.coli and non- medicated produced significant increase in AST, ALT, and ALP activities post-infection all over the experimental period. Medication of E.coli infected chickens with danofloxacin or ceftiofur sodium showed a significant decrease in AST, ALT, and ALP activities post treatment all over the experimental period compared with infected non-treated group.

2-Total protein, albumin and globulin levels:

The group non- infected treated with danofloxacin or ceftiofur sodium showed a significant decrease in serum total protein and albumin levels with a significant increase in globulin levels post- infection all over

the experimental period. Birds experimentally infected with E.coli and non-medicated evoked a significant decrease in serum total protein and albumin levels with significant increase in globulin levels post infection all over the experimental period. Treatment of E.coli infected chickens with danofloxacin or ceftiofur sodium displayed a significant increase in serum total protein and albumin levels with a significant decrease in globulin levels post treatment all over the experimental period

3-Kidney function tests:

Serum uric acid and creatinine levels were significantly increased as a result of treatment of normal chickens with danofloxacin or ceftiofur sodium. Infection of chickens with E.coli elicited a significant decrease in serum uric acid and creatinine levels. The groups infected with E.coli and medicated with therapeutic dose of danofloxacin or ceftiofur sodium showed a significant decrease in serum uric acid and creatinine levels all over the experimental period.

Electrolytes:

Danofloxacin or ceftiofur sodium administration to normal chicks displayed a significant decrease in Ca^{2+} level with a significant increase in ph^{2+} and Mg^{2+} levels. Chickens experimentally infected with E.coli and non-medicated showed a significant decrease in Ca^{2+} level with a significant increase in ph^{2+} and Mg^{2+} levels post-infection all over the experimental period. Medication of E.coli infected chickens with danofloxacin or ceftiofur sodium evoked a significant increase in Ca^{2+} level with a significant decrease in ph^{2+} and Mg^{2+} levels.

Histopathological findings:

The liver section of the group non- infected treated with danofloxacin or ceftiofur sodium showed mild degenerative changes in the hepatic cells and the liver section of the group infected with E.coli non- treated showed

severe degenerative changes and nuclear changes. The liver section of chicks infected with E.coli and medicated with danofloxacin or ceftiofur sodium showed milder degenerative changes of the hepatic cells. Kidney section of the group non-infected treated with danofloxacin or ceftiofur sodium showed mild degenerative changes of renal tubules. Kidney section of infected non- medicated chicks displayed renal parenchyma replacement with leukocytes mainly hetrophils and necrosis of renal tubular epithelium. Kidney section of chicks infected with of E.coli medicated with danofloxacin or ceftiofur sodium produced mild degenerative changes of renal tubules.

CONCLUSION

It could be concluded from the present study that administration of therapeutic dose of danofloxacin or ceftiofur sodium is of considerable value in the medication of E.coli infection in chickens

Care must be taken when danofloxacin or ceftiofur sodium used therapeutically in poultry farms because of their adverse effects on haematological picture as well as liver and kidney functions.