رقم البحث (8)

THE EFFICACY OF TWO THERAPEUTIC REGIMENS ON GROWTH PERFORMANCE, MORTALITY RATE, SOME HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS IN POULTRY.

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ABSTRACT

This study was planned to minimize the risks of veterinary drugs in poultry farms in Dakhlia and Demmiatta Governorates resembling drug resistance, drug interactions and environmental bioaccumulation due to misuse of drugs by Veterinarians and owners of farms.

The present study recorded that, Ofloxacin and Danofloxacin possessed the lowest MIC against *Staph.aureus*. Moreover, The obtained results also mirrored that, Ciprofloxacin induced a low MIC against *Strept. Fecalis*, *E.coli* and *Coryne spp*.

The present data revealed that, there were no significant changes in total feed intake, final body weight, total weight gain, total feed conversion ratio and total feed efficiency between all tested groups at the end of expermient that show evidence of the efficency of two programs for mangment of broilers.

The present study revealed that, the third group (G3) displayed the lowest mortality rate compared with two other groups.

Our finding revealed a significant decrease in ALT levels on the second group (G2) compared to the other two groups. Moreover, a significant increase was recorded in ALP levels on both treated groups (G2 and G3) compared to the control group G1

INTRODUCTION

Poultry industry is one of the largest agricultural businesses allover the world .The development of poultry industry in Egypt is increasing rabidly in recent years to fulfill the requirement for poultry meat and eggs as a source of animal protein.

Antibiotics for instance B-lactamas, aminoglycosides, macrolides, polypepetides , lincomycin and spectinomycin are usually used in poultry farms either for prophylaxis or for treatment of different bacterial infections. On the other hand, non antibiotic antibacterials like sulphonamides and fluoroquinolones are also used in the poultry industry (**Glisson,et al., 2004**).

Recently, attention has been focused on residues in poultry meat , the risk of developing resistant pathogens, and environmental bioaccumulation. In addition, other deleterious effects, such as immunosuppression, nephrotoxicity, and growth retardation have been associated with application of antimicrobials for therapy, prophylaxis, and growth promotion in poultry production **(Hayes et al. 2004).**

This study was delineated to minimize the risks of veterinary drugs use in poultry farms in Dakhlia and Demmiatta Governorates special attention was paid to drug resistance, drug residues, drug interactions and environmental bioaccumulation due to misuse of drugs by Veterinarians and owners of farms.

MATERIALS AND METHODS

(1) Enerofloxacin (Enroflux®) :

10% sterile straw color solution prepared for oral and parentral administration (El- Nasr. Co. Egypt).

(2) Ciprofloxacin (Ciprotril ®) :-

10% solution of (Veterinary and agricultural product, Co. Cairo. Egypt)

(3) Colistin :-

White powder prepared for oral administration (500.000 I.U/gm.) (El- Nasr. Com. Egypt).

(4) Neomycin :

20% White powder prepared for oral administration (El- Nasr. Co. Egypt).

(5) Erythromycin :

20% white powder prepared for oral use (Misr Co. For Pharm. Ind. Cairo. Egypt).

(6) Tylosin :

White powder prepared for oral administration (El- Nasr. Co. Egypt).

(7) Sulphaquinoxaline :

20% White powder prepared for oral administration (El- Nasr. Co. Egypt).

(8) Sulphadimidine :

As sulphadimidin sodium prepared as powder preparation for oral use. (Misr Co. For Pharm. Ind. Cairo. Egypt).

(9) Amoxicillin :

20% white powder prepared for oral use (Egyptian Co. for Veterinary Supplies)

(10) Ampicillin:

20 % white powder prepared for oral use (Misr Co. For Pharm. Ind. Cairo. Egypt).

(11) Amprol :

(Muv. Amprol®) white powder prepared for oral use (Muvco. Co. Cairo. Egypt)

(12) vit . K

(Kim K3®) 10% sterile solution prepared for oral use (Kim. Co. Egypt)

(13) Vit. AD_3E

(Vitace ®) hydrosoluble solution prepared for oral use (Uni. Co. Egypt)

2- poultry

180 one day old, white Hy-Line apparently healthy chicks transported to the laboratory of Pharmacology Department, Faculty of Veterinary Medicine , Mansoura University . All birds were reared in cages, kept in strictly isolated room, and were provided with a commercial starter feed (Cairo Poultry Company).

The expermintal design:

The poultry were classified for 3 equal groups (60 chicks for each) and given certain program as the following :

Group (1) (control) : kept as a control not given any drug .

Table (1): Where group (2) and group (3) received the following program:

weeks	Group(2)	Group (3)
1st week	Enerofloxacin (10mg/kg) Vit. AD3E (1ml/liter)	Ciprofloxacin(10mg/kg) Vit . AD3E(1ml/liter)
2nd week	Coilstin (0.5gm/Liter)	Neomycin(1gm/Liter)
2nd week	Erythromycin(0.5gm/Liter)	Tylosin (0.5gm/Liter)
3rd week	S.quinoxaline (1gm/liter) +Amprol (0.5gm/Liter) Vit. K (1gm/Liter)	S.dimidine (1gm/liter)+Amprol (0.5gm/Liter) Vit.K(1gm/Liter)
4th week	Amoxycillin (0.5gm/Liter)	Ampicilin (0.5gm/Liter)

Vaccination program:

1- Hichiner & IB: given once at the 1st week

2- IBD – blen : given once at 14 day

3- lasota : given once at 19 day.

Sampling:

Two blood samples were collected from wing vein of five chicks of each group at the end of the experment. The first one was collected in heparinized tubes for haematological investigation. The second one was collected in clean sterile centrifuge tubes and allowed to clot at room temperature. The serum was separated at 3000 rpm for 15 minutes the sera were collected in 1.5 ml Eppendroff vials and kept at -20ºC frozen until analyzed **(Stoffergen et al., 1997)** .

I: Invitro antibacterial activity:

Determination of Minimum Inhibitory Concentrations (MIC) by tube broth method (Elmer et al., 1988).

II: Haematological evaluation:

The whole blood samples were used for determination of haemoglobilin (Hb) **(Wintrobe, 1967),** Erythrocytic (R.B.Cs) and leucocytic (W.B.Cs)count **(Natt and Herrick ., 1953)** and Packed Cell Volume(PCV) % **(Cohen ., 1967).**

III: Biochemical evaluation:

Serum samples were used for determination of serum levels of Alanine aminotransferase (ALT) and serum Aspartate aminotransferase(AST) **(Reitman and Frankel. 1957)**, serum urea levels **(Patton and Crouch . 1977)**, Serum creatinine levels **(Henry. 1974),** Serum total proteins and Albumen **(Doumas et al. 1981)**.

Statistical analysis: data were statistically analysed using **SPSS** computer program **(1999).**

RESULT & DISCUSSION

(I) In vitro Antibacterial activity:

The present study reflected that, Ofloxacin and Danofloxacin possessed the lowest MIC against Staph.aureus (Table: 2) that in agreement with results obtained by **Fernández-Varón, et. al. (2007)** who studied the Minimal inhibitory concentrations (MICs) of danofloxacin against 30 strains of *Staphylococcus aureus* from several European countries.

The obtained results also mirrored that, Ciprofloxacin induced a low MIC against *Strept. Fecalis, E.coli* and *Coryne spp* (Table: 2). That reflect the high susbtability of these microorganismes to Ciprofloxacin such data are supported by **Hannon, et. al. (1989)** who suggested that, florquinolones had potent antimicrobial activity at very low concentrations when compared with other classes of antimicrobial agents.

Keeping with this line our data also revealed Ofloxacin has the lowest MIC against salmonella and Norfloxacin elicited a lowest MIC against *Pseudemonas*.

(2) Effects on total growth performance parameters:

The present data revealed that, there were no significant changes in total food intake, final body weight, total weight gain, total feed conversion ratio and total feed efficiency

between all tested groups at the end of expermient that show evidence of the efficency ratio of two programs for mangment of broilers (Table: 3).

Vitamin A necessary for growth performance and skin pigmentation in broilers **(Li, et. al. 2008)** moreover, addition of Vitamin D in form of vitamin D3 reduce the incidence of P rickets in broilers specially with good supplementation with Calcium and Phosphorus **(Shim, et. al. 2008)** that maight be explained the improvement of of performance parameter in treated gropus (G2 and G3).

Also our data mirrored the good hygenic measures during the expermint that become visible on the performance parameters of control non treated group (G1).

(3) Effects on mortality rate:

The present study revealed that, the third group (G3) displayed low mortality rate compared with two other groups (Table: 4). Theis result might be attrebuted to used of Ciprofloxacin which has a potent effect in control of most bacterial infection **(Mazi, et. al. 2008)**. Also the adiminestration of Tylosin on the second week of age evoked a prophylactic effect againest Mycoplasma spp specially that resist the other antimycoplasmic agents **(Pakpinyo and Sasipreeyajan 2007)**.

Ampicillin used in poultry farms to control of certain bacterial diseases specially Clostridia spp. **(Johansson , et. al. 2004**), Salmonella gallolyticus, Salmonella enterica and E. coli **(Kimpe, et. al. 2002)** that might also support our result in reduction of mortality rate in third group that received ampicllin at the 4th week of age.

(4) Effects on some haematological Parameter:

Our study reflected, there were no significant changes recorded on total erythrocytic count, leucocytic count, heamoglobin concentrations and PCV % of three tested groups that result was supported by non significant changes on performance parameters between tested groups (Table: 5).

(5) Effects on some biochemical Parameter:

Our finding revealed a significant decrease on ALT levels on the second group (G2) compared to the other two groups. Moreover, a significant increase was recorded in ALP levels on both treated groups (G2 and G3) compared to the control group G1 (Table: 6)

The elevation of AST and ALT is an indication of hepatic disease and necrosis in other tissues **(Zimmerman, 1984)**. Further study reflected that, the elevation of serum AST is charectrestic for hepatic toxicity **(Pashov, et. al. 1987).**

Regarding the activity of serum ALP in our data it might be attributed to quinolons administration of enrofloxacin in G2 and Ciprofloxacine in G3 that supported by results obtained by **(Hanafy, 1993)**.

Table (2): Minimum inhibitory concentrations (MICs) (µg/ml) of the tested antibacterial agents against different pathogenic microorganisms of avian origin.

Drug	Staph. aureus	Strept. fecalis	Salmonella	E. coli	Coryne. sp	Pseudemonas . sp
Ciprofloxacin	1.1	0.009	0.35	0.18	0.67	2.8
Enrofloxacin	1.5	3.1	0.39	0.19	0.78	3.1
Ofloxacin	0.39	0.78	0.19	0.39	1.5	1.5
Danofloxacin	0.39	0.78	0.39	0.39	0.78	1.5
Norfloxacin	3.1	3.1	0.39	0.39	3.1	0.39
Flumequine	6.25	12.5	6.25	3.10	12.5	3.10
Erythromycin	2.65	2.52	1.28	3.25	4.36	3.25
Colistin	6.25	4.25	5.35	3.25	6.32	5.25
Neomycin	7.25	5.36	6.55	7.25	2.35	4.28

Table (3): The effects of two therapeutic programs on total growth performance parameters of broilers at the end of experimental period.

Parameter / Group	Total feed in take (gm/bird)	Final body weight (gm)	Total weight gain (gm)	Total feed conversion ratio	Total feed efficiency
G1	4135 ± 212 [a]	2195 ± 210 [a]	2150 ±124 [a]	1.92 ± 0.2 [a]	0.52 ± 0.04 [a]
G2	4210 ±321 [a]	2434 ± 235 [a]	2390 ±321 [a]	1.76 ± 0. 1 [a]	0.57 ±0.02 [a]
G3	4195 ±245 [a]	2258 ± 272 [a]	2215 ± 214 [a]	1.89 ±0. 1 [a]	0.53 ± 0.04 [a]

The different letters at the same column means that there was a significant change ($P< 0.05$).

Table (4): The effects of two therapeutic programs on mortality rate at the end of experimental period.

Group	Total number	Mortality (No)	Mortality %
G1	60	3	5
G2	60	2	3.33
G3.	60	1	1.66

Table (5): The effects of two therapeutic programs on some haematological Parameters at the end of experimental period.

Parameter / Group	RBCs (10^6/c.m.m)	Hb(gm/dl)	PCV%	WBCs (10^3/c.m.m)
G1	3.96±0.43 [a]	8.75 ±1.12 [a]	30.9±2.12 [a]	19.95±0.32 [a]
G2	4.02±0.52 [a]	8.90 ±1.3 [a]	31.29±2.03 [a]	20.2±0.25 [a]
G3	4.05±0.36 [a]	8.63 ±1.05 [a]	29.95±1.99 [a]	19.74±0.29 [a]

The different letters at the same column means that there was a significant change (P< 0.05).

Table (6): The effect of two therapeutic programs on some biochemical parameters at the end of experimental period.

Parameter / Group	AST (µ /L)	ALT (µ/L)	ALP (µ /L)	Total protein (gm/dl)	Albumin (gm/dl)	Globulin (gm/dl)	Uric acid (mg/dl)	Createnin (mg/dl)
G1	8.85±0.38 a	9.52±0.25 a	41.24±2.2 a	5.11±0.12 a	2.85±0.08 a	2.16±0.05 a	8.16±0.35 a	1.53±0.11 a
G2	8.35±0.42 a	4.65±0.22 b	53.9±1.87 b	5.06±0.09 a	2.88±0.04 a	2.18±0.06 a	7.2±0.42 a	1.45±0.17 a
G3	8.59±0.28 a	9.5±0.23 a	52.6±2.35 b	5.04±1.01 a	2.94±0.3 a	2.08±0.1 a	7.95±0.81 a	1.39±0.1 a

The different letters at the same column means that there was a significant change (P< 0.05).

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الملخص العربى

تأثير اثنين من البرامج العلاجية على النمو و معدل النفوق و بعض المؤشرات الدمويه والبيوكيميائية فى الدواجن

محمد جبر السيد & مجدى صلاح عامر

قسم الأدوية- كلية الطب البيطرى- جامعة المنصورة

أجريت هذه الدراسة على عدد ١٨٠ طائر عمر يوم واحد وذلك لدراسة الأستخدام الأمثل والفعال للأدوية البيطرية فى محافظتى الدقهلية ودمياط وقد قسمت الطيور الى ثلاث مجموعات متساويه (٦٠ طائر)الأولى أستخدمت كمجموعة ضابطة والثانية تناولت مجموعة من المضادات الحيوية والفيتامين ومضادات الكوكسيديا تختلف عما قد أضيفت الى المجموعة الثالثة.

وقد أوضحت النتائج أن أدوية الأفلوفساكسين والدانوفلوكساسين والسيبروفلوكساسين أحدثت أعلى تأثير على الميكروبات المستخدمة فى اختبارات الحساسية.

كما بينت الدراسة عدم وجود فروق معنوية فى معدل استهلاك العلف والوزن النهائى للطيور كذلك معدل الزيادة الوزنية و التحويل الغذائى فى المجموعتين المعالجتين.

كذلك أوضحت الدراسة أن نسبة النفوق فى المجموعة الثالثة هى أقل نسبة بين المجموعات المختبرة.

كما عكست النتائج أن انزيم الألنين أمينوترنسفيراز قد أخفض معنويا فى المجموعة الثانية فى حين أن انزيم الفوسفاتيز القلويدى قد ارتفع فى المجموعتين الثانية والثالثة وذللك عند نهاية التجربة.