



Effect of Tylvalosin on Blood Parameters in Healthy Broiler Chickens

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Abstract

To evaluate the effects of Tylvalosin on blood parameters in healthy broiler chickens, twenty broiler chicks (Ross 308) aged 21 days old and weight 600-800 gm was divided into two equal groups, the first one was control group (G1) and the second one was treated group (G2). G1 dosed with 1ml/kg of body weight of normal saline while G2 dosed with 25mg/Kg of body weight of Tylvalosin. Blood samples were collected with EDTA tubes after 4 days of treatment. The results showed significant decrease in total WBCs counts in G2 treated group as compared with control group (G1), also the eosinophil showed a significant decrease in G2 as compared with G1, while other parameters didn't show any significant differences.

In conclusion, WBCs were decreased after treatment with tylvalosin.

Key Words: Tylvalosin, Blood, Broiler.

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Introduction

Macrolides are used predominantly to manage gastrointestinal, skin, soft tissue as well as urogenital diseases (Piscitelli *et al.*, 1992). The lactone group, which is 14- [erythromycin (ERM), clarithromycin (CAM) and roxithromycin (RXM)], 15- [azithromycin (AZM), or 16-membered (Spiramycin, Josamycin, Midecamycin, etc.), is a macro-cyclic lactone ring (Zuckerman, 2004). The macrolide's antimicrobial activity results from the inhibition of synthesis of bacterial proteins through reversible binding to the ribosome exit peptide tunnel (Tenson *et al.*, 2003).

As an active substance, Aivlosin is a veterinary medication with the antibiotic macrolide tylvalosin (former name: acetylisovaleryltylosin). Pigs, chickens and pheasants are the target animals. For the care and prevention of respiratory disease associated with chickens, Aivlosin is suggested for three days in potable water for a dose of 25 mg per

kg bodyweight a day (European Medicines Agency, 2009).

AL-Bayaty and AL-Shawi analyzed in 2014 the impact of complementing the numerous dietary antibiotic levels (Tylosin 20 percent) on the Blood Image of Common Carp; statistically Red Blood Cell (RBC) counts did not demonstrate major differences between treatments; neutrophils, monocytes, eosinophils and Basophils did not display any noticeable differences across all experimental treatments.

This study aimed to evaluate the effects of Tylvalosin on blood parameters in healthy broiler chickens.

Materials and Methods

Twenty broiler chicks (Ross 308) aged 21 day old and weight 600-800 gm was divided into two equal groups, the first one was control group (G1) and the second one was treated group (G2).

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G1 dosed with 1ml/kg of body weight of normal saline while G2 dosed with 25mg/1ml /Kg of body weight of Tylvalosin (Avilosin®, Eco company, UK) for three consecutive days according to the manufacturer. In the fourth day blood samples were collected with (EDTA) test tubes and directly the hematological tests was made according to (Barger and Macneill, 2015). The result was statically

analyzed by T-test (independent samples test) by using SPSS software (IBM®, SPSS® statistics, version 26).

Results

The current results showed normal hematological parameters in chickens listed in table 1.

Table 1. Descriptive statistics of G1(control group) blood parameters with P-value of Levene's Test for Equality of Variances.

Blood Parameter	Mean	SEM	SDM	Minimum	Maximum	P-value
Hb (g/dl)	8.96	0.20	0.65	7.50	10.20	0.202
PCV (%)	29.70	0.71	2.263	25.00	34.00	0.097
RBC (x10 ⁹ /l)	1.33	0.20	0.45	0.80	2.00	0.056
MCV (fl)	243.94	39.29	87.86	140.00	375.00	0.244
MCH (pg)	1446.96	1372.30	3068.57	44.50	6936.00	0.076
WBC (x10 ⁶ /l)	8.46	1.16	3.50	1.80	15.00	0.117
Neutrophil (%)	35.51	4.65	13.96	0.20	43.70	0.080
Lymphocytes (%)	33.24	3.69	11.09	3.80	39.10	0.462
Monocytes (%)	14.50	1.72	5.18	1.50	18.80	0.088
Eosinophil (%)	3.95	0.16	0.50	3.30	4.90	0.666
Basophiles (%)	2.46	0.22	0.68	1.30	3.60	0.677
Platelets (Plate/ml)	370000	33862.46693	107082.52	180000.00	560000.00	0.928
ESR	7.25	0.75	2.12	7.50	10.20	0.129

SEM: standard error of mean, SDM: standard deviation of mean.

Table 2 show hematological parameters in chickens after treatment with tylvalosin.

Table 2. Descriptive statistics of G2(Treated group) blood parameters with P-value of Levene's Test for Equality of Variances

Blood Parameter	Mean	SEM	SDM	Minimum	Maximum	P-value
Hb (g/dl)	8.31	0.38	1.00	6.90	9.60	0.291
PCV (%)	27.71	1.26	3.35	23.00	32.00	0.392
RBC (x10 ⁹ /l)	14.73	12.12	29.69	1.00	75.00	0.319
MCV (fl)	283.09	19.06	46.68	200.00	333.33	0.405
MCH (pg)	84.91	5.71	14.00	60.00	100.00	0.377
WBC (x10 ⁶ /l)	2.82	0.29	0.824	1.60	4.00	0.069
Neutrophil (%)	43.39	0.80	2.55	39.90	48.20	0.192
Lymphocytes (%)	38.06	0.55	1.75	33.70	39.70	0.365
Monocytes (%)	14.87	0.61	1.95	12.10	18.30	0.731
Eosinophil (%)	2.36	0.30	0.955	1.30	3.70	0.186
Basophiles (%)	1.96	0.23	0.73	.80	3.20	0.254
Platelets (Plate/ml)	332500	31153.42	88115.18	230000.00	450000.00	0.216
ESR	5.25	0.36	1.03510	4.00	7.00	0.291

SEM: standard error of mean, SDM: standard deviation of mean.

The current study showed significant decrease in total WBCs counts in G2 treated group as compared with control group (G1), also the eosinophil showed

a significant decrease in G2 as compared with G1, while other parameters didn't show any significant differences (Table 3).



Table 3. Comparison blood parameters between G1 (control group) and G2 (Treated group)

Blood Parameter	G1 (Control) (Mean±SE)	G2 (Treated) (Mean±SE)	P-value
Hb (g/dl)	8.96±0.20	8.31±0.38	0.314
PCV (%)	29.7±0.71	27.71±1.26	0.419
RBC (x10 ⁹ /l)	1.33±0.20	14.73±12.12	0.343
MCV (fl)	243.944±39.29	283.09±19.06	0.367
MCH (pg)	1446.962±1372.30	84.91±5.71	0.300
WBC (x10 ⁶ /l)	8.4667±1.16 ^A	2.82±0.29 ^B	0.026
Neutrophil (%)	35.5111±4.65	43.39±0.80	0.120
Lymphocytes (%)	33.2444±3.69	38.06±0.55	0.384
Monocytes (%)	14.5±1.72	14.87±0.61	0.698
Eosinophil (%)	3.9556±0.16 ^A	2.36±0.30 ^B	0.000
Basophiles (%)	2.4667±0.22	1.96±0.23	0.182
Platelets (Plate/ml)	370000±33862.46693	332500±31153.42	0.243
ESR	7.25±0.75	5.25±0.36	0.171

SEM: standard error of mean, SDM: standard deviation of mean.
 Different capital letters refer to significant differences P≤0.05

Discussion

Tylvalosin is widely used for mycoplasma and other respiratory disorders in our poultry farms for care of poultry and swine. We had no prior observations of the impact of Tylvalosin on hematological parameters from our point of view.

A significant measure of the medical or physiological state of the body is the hematological profile in animals (Khan and Zafar, 2005).

The presented study showed a significant decrease in WBCs counts in G2 treated with tylvalosin, these findings were like those reported after administration of tilmicosin and induced statistically significant decreases in the number of rabbits from the WBC and reached high levels of avian, pig and bovine phagocytes (Altunok *et al.*, 2002). Azithromycin and clarithromycin have also been reported to lower the number of WBCs in humans (Fujii *et al.*, 1995; Ohtsuka *et al.*, 1996).

A special research in Wistar rats (25/sex/group, 6-7 week old) showed that a high dose of male rats found substantial reductions in white blood cells at termination with a 0,1, 0,5 or 1,0 percent tylosin base for around 10 weeks and 6 months later (Broddle *et al.*, 1978).

Also, it has been documented that administration of Azithromycin (AZM) lead to decrease in WBCs (Parnham *et al.*, 2005).

AL-Bayaty and AL-Shawi analyzed in 2014 the impact of complementing the numerous dietary antibiotic levels (Tylosin 20 percent) on the Blood Image of Common Carp; statistically Red Blood Cell (RBC) counts did not demonstrate major differences between treatments; neutrophils, monocytes,

eosinophils and Basophils did not display any noticeable differences across all experimental treatments.

Conclusion

The treatment of chickens with tylvalosin causing decreases in WBCs.

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