

Effect of Varying Doses of Estradiol Benzoate on the body weight and blood picture in Turkeys

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Summary

A present study was carried out to investigate the effects of Estradiol benzoate 2 (mg/ml) hormone doses on the body weight and blood picture of Turkeys birds through studying the following parameters: body weight, RBC count , total WBC, MCV, MCH, MCHC, and platelet PLT. Forty growing Turkeys (30 days age) weighting between (250-350)gm were randomly divided into four groups (ten each group) treated as follows: Turkeys in the first group were injected with single dose of Estradiol benzoate (1 mg) on the first day of experiment (30 day post hatching) subcutaneously in the neck and termed as G1 group, the Turkeys in the 2nd group (G2) were injected Estradiol benzoate (2 mg) on the first day of experiment subcutaneously in the neck while the Turkeys in the third group (G3) were injected Estradiol benzoate (0.3 ml) at the first day of experiment subcutaneously in the neck the fourth group (G4) served as control, body weight was determined on (0, 15 and 30) days of experiment and blood samples were collected on 15th and 30th day of the experiment from groups to evaluate the blood parameters. Results revealed a significant increase ($P<0.05$) in body weight of G1, G2 and G3 in a comparison with control group at (15 and 30) days of experiment. Furthermore, in comparison among treated groups G2 and G3 also showed a significant increase ($P<0.05$) in the body weight as compared with G1 group during periods. Moreover, data revealed that all treated groups showed non-significant differences in blood parameters experiment as compared with control group.

Keywords: - Estradiol benzoate, Turkey bird, Turkeys blood picture.

تأثير الجرعة المختلفة لهرمون استراديول بنزويت على وزن الجسم وصورة الدم في الدواجن (التركي)

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الخلاصة

صممت هذه الدراسة لمعرفة تأثير جرعات مختلفة لهرمون الاستراديول بنزويت (2ملغ / مل) على وزن الجسم والصورة الدموية لدجاج الرومي وذلك من خلال دراسة المعايير التالية: وزن الجسم، حساب عدد كريات الدم الحمراء، والعد الكلي لخلايا الدم البيض، و MCV و MCH و MCHC و PLT. تم استخدام 40 من أفراخ الرومي (بعمر ثلاثين يوم بعد التفقيس) معدل أوزانها 250-350 غم وقسمت عشوائيا إلى أربعة مجاميع وبواقع عشرة حيوانات/مجموعة. وعوملت كالأتي: حيوانات المجموعة الأولى أعطيت 1 ملغم من الاستراديول بنزويت تحت الجلد في منطقة الرقبة مرة واحدة في أول يوم من التجربة وسميت بالمجموعة G1، حيوانات المجموعة الثانية G2 أعطيت 2 ملغم من الاستراديول بنزويت تحت الجلد في منطقة الرقبة مرة واحدة في أول يوم من التجربة، أما حيوانات المجموعة الثالثة G3 أعطيت 3 ملغم من الاستراديول بنزويت تحت الجلد في منطقة الرقبة مرة واحدة في أول يوم من التجربة، المجموعة الرابعة G4 اعتبرت مجموعة سيطرة. تم حساب الوزن في الأيام 0، 15، 30 من التجربة وأخذت عينات الدم في الأيام 15 و 30 من فترة التجربة لغرض دراسة المعايير الدموية. أظهرت النتائج إن معدل وزن الجسم قد ازداد وبشكل معنوي ($P<0.05$) في المجاميع المعاملة بالاستراديول بنزويت G1 و G2 و G3 مقارنة بمجموعة السيطرة في الأيام 15 و 30 من التجربة. بالإضافة لذلك أظهرت نتائج المجاميع G2 و G3 حصول زيادة معنوية ($P<0.05$) في معدل وزن الجسم بالمقارنة مع المجموعة G1 وفي الفترات نفسها. علاوة على ذلك فقد بينت النتائج بأن جميع المجاميع لم تظهر أي فروقات معنوية في الصورة الدموية بالمقارنة مع مجموعة السيطرة في أيام التجربة كلها.

الكلمات المفتاحية: الاستراديول بنزويت , الدجاج الرومي , الصورة الدموية .

Introduction

Farmers as well as scientists were looking for newer varieties of domesticated birds, which have sufficient potential to grow fast and provides a meat on economic basis. Under these circumstances Turkey industry was began to grow in many countries, Since of Turkey's meat while providing all essential substances as other meat has comparatively low percentage of fat and high percentage of proteins (1).

A hematological profile in animal sciences is an important index of the physiological state of the individual. The ability to determine the state of blood profile in both normal and in diseased cases is among its primary tasks. It has been seen by many researchers that there is a definite change in the profile of the blood cells throughout the life (2, 3, 4, 5, and 6). This feature has been attracted many workers and still much work is being done. Not only the blood parameters varies with the progress of the age and weight but it also varies with certain conditions as stress, bacterial infection, viral infection, intoxication and hormonal changes.

The blood of the domestic fowls contains erythrocytes, thrombocytes, non-granular leukocytes and granular leukocytes, suspended in plasma (7 and 8). Most workers have studied on avian blood had found a great variation of R.B.C. and considered it to be normal (9). It was concluded that R.B.C. and other parameters such as Hb and E.S.R. of a bird varies among species, other factors, which affect the counts, include breed, sex and the nutrition supplied to the bird (10).

While Turkeys are emerging as an important source of animal protein, the available records on effect of Estradiol benzoate on the body weight and haematological profile of Turkeys are very scanty. Hence this study was undertaken to arrive some aspects of the effects of Estradiol benzoate on the body weight and haematological parameters of different groups of Turkeys.

Materials and Methods

Forty growing Turkeys (30 days post-hatching) were obtained from Erbil poultry breeders and reared on deep litter at the farm of poultry (College of Veterinary Medicine\Kufa University), and fed ad libitum on diet obtained commercially. Ten birds per group were blood collected from wing vein using sterile disposable syringe (23 gauge). The weight was taken using sensitive balance (Agilent- USA) on (0, 15, and 30) days of experiment, using hematology analyzer (auto-analyzer) SCIE-Plus company-Belgium. Estradiol benzoate: Estrogen in the form of Estradiol benzoate is available locally as synthetic estrogen by the name of Estradiol benzoate injection 10 ml, a product of WE-YOUNG pharmaceuticals, China. Each ml of the Estradiol benzoate injection contains 10 mg of Estradiol benzoate in oily solution. The synthetic estrogen in the form of Estradiol benzoate was administered in different doses of 1mg, 2mg and 3mg to the birds of age 30 days, subcutaneously in the neck. Statistical analysis of data was performed on the basis of two-way analysis of variance ANOVA II. Group differences and within group differences were determined using least significant difference (LSD) test at ($P < 0.05$) (11).

Results and Discussion

Results of table (1) have demonstrated the effect of Estradiol Benzoate on body weight. Results showed a significant increase ($P < 0.05$) of body weight in the Estradiol Benzoate treated groups G1, G2 and G3 as compared with the control group at all period of experiment except zero time, and showed that higher doses of Estradiol Benzoate caused an increase of the body weight of G2 and G3 as compared with G1 group at the same periods.

Furthermore, there were significant differences in body weight within all groups along the periods of experiment (table: 1).

(Table: 1): Effect of different Doses of Estradiol Benzoate hormone on the body weight in Turkeys birds (M± E).

Groups	Control group	G ₁ group 1 mg	G ₂ group 2 mg	G ₃ group 3 mg
Periods				
Zero day	3.30 ± 0.09	3.19 ± 0.10	3.27 ± 0.07	3.33 ± 0.11
Day 30 (age)	C c	C c	C c	C c
Day 15	5.54 ± 0.16	5.95 ± 0.07	8.30 ± 0.16	8.26 ± 0.12
Day 45 (age)	C b	B b	A a	A a
Day 30	6.91 ± 0.07	7.64 ± 0.02	9.74 ± 0.09	9.80 ± 0.19
Day 60 (age)	C a	B a	A d	A d

L.S.D: Weight= 0.4527.

The different capital letters denote significant differences among groups (P<0.05).

The different small letters denote significant differences among periods (P<0.05).

The results of RBC count, total WBC, MCV, MCH, MCHC and PLT are showed in (Table: 2). There were non-significant changes in all treated groups of G₁, G₂ and G₃ in comparison with control one. Furthermore, there were non-significant changes were observed within all periods in all experimental groups. Data concerning body weight as influenced by Estradiol benzoate injection was presented in (table: 1). Turkeys injected with Estradiol benzoate at 30 days of age had a significantly higher body weight on 15 and 30 days of experiment in all Estradiol benzoate treated groups as compared with the control group, the increase in body weight on 15 and 30 days of experiment may be attributed to the effects of Estradiol because the estrogen is known to induce hyperlipemia in birds (12 and 13). This hyperlipemia is approximately proportional to the degree of fat deposition (14). Estrogen administration to chickens tends to decrease metabolism (15) and activity and fattening effects may be attributed in part to these factors. A slight over weight of the estrogenated birds is the result of increased abdominal fat and not actual growth and it also improves the grade of carcass of chicken. This has been demonstrated in broilers, roasters and cocks (16). On the other hand, the increase in body weight may be due to the changes in carbohydrate metabolism induced by estrogen treatment which is intimately involved in glucose metabolism (17). Results are in agreed with that of (18 and 19) who found that implanting chickens with stilbestrol improved carcass weight, quality and increased chickens body gain. Also other workers (20 and 21) reported that feeding 140 mg dienestrol diacetate/kg of diet to Leghorn type pullets increased their body weight and improved weight gain. Douglas *et al.*, (22) recorded an increase in body weight gain of layers fed diets supplemented with synthetic estrogen (dienestrol diacetate). Moreover, Elghalid (23) reported an increase in quails' body weight as a result of Estradiol treatment and related that to increased organs weight as liver's, ovaries' and oviduct's relative weights showed significant increases associated with estrogen treatment.

Estrogen, a steroidal hormone secreted by ovaries enhances lipid metabolism, increases sedimentation rate of red blood cells and lowers the count of red blood cells. Present study was designed in the light that limited reports have been made on the effect of estrogen on Turkey's blood so the current study showed no significant changes in blood parameters may be due to the dose was not enough to induce changes in blood parameters (24).

Table 2: Effect of varying doses of estradiol benzoate on the blood picture in Turkeys

Groups	Control group		G1 group		G2group		G3 group	
	Day 15	Day 30						
	45 day (age)	60 day (age)						
PLT	5.40±0.678	4.95±0.916	6.01±0.927	5.50±0.95	5.76±1.80	5.40±0.24	5.61±1.80	4.91±0.50
MCHC	32.76±0.186	32.76±0.508	33.26±0.377	32.64±0.34	33.12±0.41	33.0±0.40	33.12±0.41	32.56±0.25
MCH	40.40±0.738	41.08±1.404	41.48±0.973	41.98±0.973	40.52±0.85	41.56±0.56	40.52±0.85	40.18±1.24
MCV	123.36±2.305	125.4±4.070	123.74±3.14	123.44±2.75	122.22±1.32	124.94±0.87	123.22±1.32	124.04±3.33
RBC	2.892±0.061	2.59±0.099	2.832±0.078	2.65±0.06	2.82±0.07	2.61±0.05	2.82±0.07	2.64±0.07
WBC	262.72±2.20	263.42±5.01	261.78±0.29	260.84±2.61	261.02±2.21	262.6±2.68	260.9±230	260.78±2.05

L.S.D. WBC=6.7625, RBC =0.501, MCV= 6.4869, MCH= 3.0518, MCHC= 1.0592, PLT= 1.2065.

Values are presented as Mean ±SE (n=10 Turkey/ groups).

(G1, G2 and G3) groups given (0.1, 0.2 and 0.3) ml of estradiol benzoate consequently.

The PCV increased with age in Turkeys (25, 26 and 27). Lisano and Quay, (28) observed that PCV values increased with age in the first nine months and gradually declined over the next 4 months in Turkeys. In conclusion the current study showed no significant changes in blood parameters probably there was a decline in blood cells number but it not appeared because the total number of blood cells are normally increased with the age advancement this may be compensated the declined number of blood cells and made it not changed. Moreover, the period of experiment was so short perhaps this was one of the reasons that prevent Estradiol benzoate to exert their real effects on blood profile of Turkeys.

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