IJBPAS, August, 2014, 3(8): 1960-1965

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

EFFECTS OF CORTICOSTRONE INTAKE AS STRESS ALTERNATIVE HORMONE ON JAPANS QUAILS: PERFORMANCE AND BLOOD PARAMETERS

HOSSEINI A* AND KHALILZADEH KHOSROSHAHI M

Department of Veterinary Medicine, College of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran

***Corresponding Authors' E Mail: akam.hosseini@gmail.com**

ABSTRACT

This study was conducted to determine the effects of blood Corticosterone (CS) increasing on some physiological parameters and performance of Japanese quail. To avoid treatment of birds with various forms of stress with administration of CS a model was developed to study of mimicked stress in poultry. Total 180 one-day old male Japanese quail were placed in 12 pens. CS at 4 levels (0, 10, 20 and 30 mg L^{-1} in drinking water was provided free access between 1 to 42 days of age. Continuous intake of CS for 42 days caused increasing in serum glucose, cholesterol, triglycerides, and mortality. Last body weight and total feed intake were decreased, whereas feed conversion ratio was increased. Therefore, it seems that CS intake is an alternative tool and useful test for assess the effects of physical, psychological and physiological stress in researches on Japanese quails.

Keyword: Corticosterone, Stress, Japans Quail

INTRODUCTION

corticostron is a main steroid that maid in supper kidney glands. Producing of aldestrone is much less than corticostron on way that the percent of aldestrone in consider of corticostron is 1/14 in poultry and 1/63 in ducks. Other corticoid especially those that made in embryonic period contain cortisone and cortisol. Cortical part of supper kidney gland produce is become more in the high stress like die condition. High stress increase volume of corticostron and various volume of Ascorbic Acid that made in supper kidney gland. Hypertrophy of the internal zone of IZ happen in the continually stress increasing of corticostron is deferent in various condition. Because of animal rights in this study changing of stress effects on

birds is measured whit new method whit adding corticostrone whit deferent valium in drinking water.

MATERIALS AND METHODS

180 one-day old Japanese quail were divided in to the 4 random groups and each group has 3 repeat that contain 15 birds. First group was chosen as a checking group and others as test groups. Birds are examined in the same condition and time of period was 42 day. Corticostron added to the water whit 1/1000 percent and mixed in to the drinking water of the groups from the first day until the end of the period. We added 10 mg/dl corticostron for group2, 20 mg/dl for group3 and 30 mg/dl for group4. For monitoring of blood corticostron we take 6 sample (2 bird in each cage) in 10, 20, 34 and 42 days and analyses whit ELISA method and also some other blood sample are taken randomly (1 bird in each cage) in the same time and centrifuged whit 500 rpm for 5 min then serum divided and blood parameters analyzed whit (Alcyon 300) auto analyzer. Also we checked the total body weight and total used food and mortality for estimate the groups grows at the end of the period. SAS (1994) software is used for analyzing of the sample **[1]**.

RESULTS

In **Table 1** you can see the food ingredients that we used for feeding the guiles in all the growing period. All the groups feed whit the same food. In **Table 2** you can see corticostron changes in all 4 period of examining time. In **Table 3** you can see the Blood glucose changes in all 4 period of examining time that increase whit increasing the dosage. In the **Table 4** you can see the Blood cholesterol changes in all 4 period of examining time and **Table 6** show the group growing and total intake food and also there total body weight and there mortality. This table shows that mortality became more with increasing the corticostron and also there used more food and les growing. By the result last body weight and total feed intake were decreased, whereas feed conversion ratio was increased. Therefore, it seems that CS intake is an alternative tool and useful test for assess the effects of physical, psychological and physiological stress in researches on Japanese quails.

Table 1: Basic Food Ingredients

Food ingredients	Volume
Corn	50
Soy been	45
Vegetable oil	1.5
Dcp	1
Shell powder	1.5
DL-methyonin	0.15
Salt	0.15
Vitamin	0.25
Mineral	0.25
Vitamin E	0.1
Vitamin A	0.1
Total	100
Energy (kcal/kg)	2900
Pro (%)	24
Cal (%)	1.20
Phosphorus (%)	0.55
(%) DL-methionine	0.75
(%) Lysine	1.47

Table 2: Blood Corticostron Changes (mg/dl)

Control day	Group 1 (0mg/dl)	Group2 (10mg/dl)	Group3 (20mg/dl)	Group4 (30mg/dl)
10	11.2± 0.4 ^{d}	14.3±0.5 ^{c}	17.8±0.8 ^{b}	24.0±0.9 ^{a}
20	11.8± 0.4 ^{d}	14.1±0.2 ^{c}	18.0±1.0 ^{b}	26.1±0.9 ^{a}
34	11.7± 0.3 ^{d}	15.0± 0.6 ^{c}	19.1±1.1 ^{b}	26.7±1.3 ^{a}
42	11.9± 0.5 ^{d}	15.1± 0.7 ^{c}	18.2±0.9 ^{b}	26.92±1.2 ^{a}

***Non Similar Alphabet in Each Colum Show the Meaningful Deferent (p<0.05)**

Table 3: Blood Glucose Changes

Control day	Group 1 (0mg/dl)	Group2 (10mg/dl)	Group3 (20mg/dl)	Group4 (30mg/dl)
10	238± 11 ^{c}	236± 12 ^{c}	261± 15 ^{b}	291± 20 ^{a}
20	244± 9 ^{d}	252± 12 ^{c}	272± 19 ^{b}	298± 21 ^{a}
34	251± 14 ^{c}	262± 16 ^{b}	287± 18 ^{a}	292± 26 ^{a}
42	248± 14 ^{d}	267± 17 ^{c}	281± 14 ^{b}	308± 21 ^{a}

*** Non Similar Alphabet in Each Colum Show the Meaningful Deferent (p<0.05)**

Table 4: Blood Cholesterol Changes

Control day	Group 1 (0mg/dl)	Group2 (10mg/dl)	Group3 (20mg/dl)	Group4 (30mg/dl)
10	120±18	118±19	131±26	138±21
20	117± 17 ^{c}	130± 21 ^{b}	128± 14 ^{b}	169± 19 ^{a}
34	122± 10 ^{d}	138± 14 ^{c}	151± 11 ^{b}	174± 16 ^{a}
42	132± 14 ^{c}	145± 13 ^{b}	152± 12 ^{b}	181± 19 ^{a}

*** Non Similar Alphabet in Each Colum Show the Meaningful Deferent (p<0.05)**

Table 5: Blood Triglyceride Changes

Control day	Group 1 (0mg/dl)	Group2 (10mg/dl)	Group3 (20mg/dl)	Group4 (30mg/dl)
10	161±9	162±11	163±11	171±14
20	157± 16 ^{b}	168± 20 ^{b}	191± 19 ^{a}	187± 11 ^{a}
34	151± 15 ^{c}	169± 12 ^{b}	189± 14 ^{a}	181± 16 ^{a}
42	161± 14 ^{b}	176± 17 ^{b}	191± 16 ^{a}	190± 18 ^{a}

*** Non Similar Alphabet in Each Colum Show the Meaningful Deferent (p<0.05)**

Table 6: Average of Group Growing In Exams Period

	Group 1(0mg/dl)	(10mg/dl)Group2	Group3 (20mg/dl)	Group4 (30mg/dl)
(gr/bird) Total food	695±5 ^{a}	691±4 ^{a}	682±6 ^{b}	670±6 ^{c}
(gr) Total body weight	233± 3 ^{a}	230± 4 ^{a}	210± 5 ^{b}	209± 4 ^{b}
FCR	2.99 ^{b}	3.00 ^{b}	3.25 ^{a}	3.21 ^{a}
(%) Mortality	2.1	1.7	2.9	4.0

*** Non Similar Alphabet in Each Colum Show the Meaningful Deferent (p<0.05)**

DISCUSSION

Health of animal becomes an important pattern in these days because there have an economic and emotional effect. Near 40 stress pattern like transport **[2]** crowd **[3]** coccidiasis and cheek cutting **[4]** temperature **[5, 6, 7]** and bacterial disease were reported. There is a lot of kind of stress but all of them have a same effect. Koolhaas *et al* 2001 show that stress effects on body whit two mechanism, first one is simpatic-medullary Adrenalin and the second one is limbic hypotalamos - hypophis- Adernocortical and this are release Glococorticoids and effect of glococorticoids on stress are mention **[8]**. Saposky and *et al* 2000 and Puvadolperiod 2000, search on poultry stress effect and find the way of study stress effect whit Adernocorticotropic(ACTH) **[9, 10]** . Recently Post *et al* 2003 show the effect of increasing corticostron in plasma in some physiological parameters in chicken and say that giving of corticostron can be a way of showing poultry stress effect **[11]**. Corticostron is one of the most important compound of glococorticoids in poultry that has a various effect such as helping of carbohydrate metabolism and support gloconeogenesis, metabolism of fat and increasing energy with releasing fatty acid and various effects on stress and changes of blood cell like reduce oesinophil and lymphocyte, increasing of notrophil and RBC. So giving of corticostron has a stress effect on poultry. Vahdatpoor *et al* 2009 show that increasing of blood corticostron level can have an various effect like reduce food intake and total Weight in poultry ($p< 0,05$) **[12]** and this research has also same result that show whit post *et al* 2003, Bong *et al*., 2007 **[11, 13]**. Vahdatpoor *et al* show that corticostron can be reducing the fat ($p< 0, 05$) **[12]**. Vahdatpoor *et al* show that corticostron can be increase death level like stress ($p<0.05$) **[12]**. Virden *et al* 2007 reported that adding of corticostron increase the death number and reduce the total weight, poultry performance from first day until day 40 ($p<0.05$) **[14]**.

REFERENCES

[1] SAS institute SAS, state software: Change and Enhancement through Release 8.2. SAS Institute, Inc Cary, NC, 2001.

[2] Mitchel MA and kettlewell PJ, physicological stress and welfare of broiler chickens in transit: solution not problems, Poult. Sci., 77, 1998, 1803-1814.

[3] Patterson PH and Siegel HS, impact of cage density on pullet performance and blood parameters of stress, Poult. Sci., 77, 1998, 32-40.

[4] Mckee JS and Harrison PC, Effect of supplemental ascorbic acid on the performance of broilers chickens xposed to multiple concurrent stressors, Poult. Sci., 74, 1995, 1772-1785.

[5] Arjona AA, Denbow DM and Wear WD, Effect of heat stress early in life on mortality of broilers xposed to high environmental tempratures just prior to marketing, 67, 1988, 226-231.

[6] Jong IC, A.Van Voorst, Erkens JHF, Ehlhardt DA and Blokhuris HJ, Determinaticon of the circadian rhythm in plasma corticostrone and catecholamine concentration in growing broiler breeders using intravenous cannulation, Physiol. Behav., 74, 2001, 299-304.

[7] Sandercock DA, Hunter RR, Nute GR, Mitchell MA and Hocking PM,, Acute heat stress-in doucet altheration in blood acid-base status and skeletal muscle membrane integritating in broiler chickens at two ages ,implications for meat quality, Poult. Sci., 80, 2001, 418-425.

[8] Koolhaas JM, Korte SM, Deboer SF, Vandervagt BJ and Vanreenen CG, *et al*., coping s in animals:current status in behavior and stress, Physiol. Neurosci. Biobehav. Rev., 23, 2001, 925-935.

[9] Sapolsky RM, Romero LM and Mnck AU, How do glococorticoids influence stress reponses? Intergrading permissive, suppressive, stimulatory and pre parative actions, Endocrine Rev., 21, 2000, 55-89.

[10] Povadolpirod S and Thaxtom JP, model of physicological stress in chicken .I. Response parameters, Poult. Sci., 79, 2000, 363-369.

[11] Post JJ, Rebel MJ and Terhuurne AAHM, Physicological effects of elevated of elevated plasma corticostrone in broiler chickens, An alternative means by which to assess the physicological effects of stress, Poult. Sci ., 82, 2003, 1313-1318.

[12] Vahdatpour T, Nazer K, Adl, Ebrahim nezhad Y, Mahery Sis N, Riyazi SR and Vahdatpour S, effects of corticostrone Intake as stress Alternative Hormone on broiler chickens: performance blood parameters , Asian J. Animal and Vet. Adv., 4 (1), 2009, 16-21.

[13]] Dong HL, Jiao HC, Song ZG, Zhao GP and Jiang KJ, Alfered development and protein bolism in

skeletal muscles of broiler chickens (Gallus gallus domesticus) by corticostrone, Comp. Biochem. Physical. Mol. Integr., 147, 2007, 189-195.

[14] Virden WS, Thaxron JP, corzo A, Dozier WA and Kidd MT, Evalution of models using corticostrone and adrenocorticostropin to in stress in commercial broilers, Poult. Sci., 86, 2007, 2485-2491.