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BODY WEIGHT OF MALE RAIN QUAIL, *Coturnix-coromandelica* AS EFFECTED BY NEOMERCAZOLE AND TESTOSTERONE

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Abstract

This study aims to investigate the effect of neomercazole and testosterone on body weight of male Rain Quail (*Coturnix-coromandelica*) for a period of six months. Birds wee divided in to four groups in which first group was treated as control. Group I and II have normal birds and an Group III and IV birds were castrated. In Group II each bird received 1.5 ml vehicle per month. In Group II each bird received 5 mg neomercazole per month and in Group IV the bird received 1.5 mg testosterone per month. In all the birds maximum body weight was observed in January except in control group which showed significant body weight in February. The minimum body weight was varied at different times in different groups.

Key words - Neomercazole, Testosterone, Body weight, Castrated, Vehicle.

Introduction

This study investigates the effect of neomercazole and testosterone on body weight of normal and castrated male Rain Quails.

Administration of testosterone after castration in amounts that restore plasma concentrations to physiological or supra-physiological levels can reverse all the effects of castration (Kalra and Kalra, 1980) and reduce the responsiveness of the pituitary gland toward GnRH in vivo (Kalra and Kalra, 1982). Testosterone has also been identified to control antibody production and plumage coloration in male house sparrows (Passer domestics) by Evans *et al.,* 2000. Researchers have established the effect of testosterone and its impact on life strategies of birds (Michaela Hau *et al.,* 2010). Effects of environmental and social factors in testosterone treated tropical birds was studied by Goymann *et al.* (2004).

The role of thyroid gland in the regulation of the annual body weight has been demonstrated in a number of avian species (Assenmacher 1973; Thapliyal, 1981). Thyroid is also involved in the regulation of breeding cycles of temperate zone birds (Jallageas *et al.*, 1978; Nicholls, *et al.*, 1985; Sharp and Klandorf, 1985).

Hypothyroidism in Indian finches, whose gonadal cycles are not regulated by light, leads to increase in the body weight which after reaching a maximum, follow a plateau (Thapliyal and Pandha, 1967; Thapliyal, 1968). Effects of surgical thyroidectomy have been extensively studied in wild birds (Wieselthier and Van Tienhoven, 1972).

Surgical thyroidectomy is a very crucial stage and it includes complete removal of thyroid gland which leads to a severe hypothyroid state. In the present work attempt has been made for gradual

regression of thyroid by chemical thyroidectomy (by administration of an antithyroid drug neomercazole diluted in 0.9% vehicle). The study aims to find out the effect of neomercazole solution and testosterone on body weight of male Rain quails.

Material and Methods

Twenty birds were separated from the stock. Ten birds were caponized in October, 2016. In November remaining ten birds were weighed individually. Caponized birds were also weighed individually on the same day.

All birds were divided into four groups comprising of equal number and housed in separate wire net cages of same size (18" x 12" x .9"). The duration of the experiment, the groups, status and number of birds and the dosages used are listed in the table. Group I and III birds received 1.5 ml. vehicle per month. In group II each bird received a total dose of one tablet of Neomercazole (5 mg.) in one month and in group IV the bird received a total dose of 7.5 mg testosterone (Aquaviron; 1 ampoule = 25 mg. in 1 ml.) during one month.

The birds were injected intramuscularly on alternate day (15 days in a month) in the morning between 9:00 - 10:00 hours. The treatment was started from November 2016 and the experiment was terminated in April, 2017.

After the 24 hours of last injection of the month the birds of group I and II were laparotomized. The body weight was also recorded. After the 24 hours of last injection of the month the body weight of birds of all the groups was recorded.

Results

Body Weight

The mean body weight in gms. (M $\pm$ SE) of different groups is represented in the tabular form in table.

Table : Showing the effect of Neomercazole (in normal birds) and Testosterone (in castrated birds) on the mean body weight ((M$\pm$SE) of male Rain quails, (*Coturnix-coromandelica*).

Groups	I	II	III	IV
Status of Bird	Intact	Normal	Castrated	Castrated
Dose per Bird/day	0.1 ml. Saline	0.1 ml. Neomecrazole solution	0.1 ml. Normal saline	0.5 mg Testosterone
November 2016	56.67 +3.65 - (5)	58.00 +2.01 - (5)	58.67 +2.14 -(5)	55.60 +1.89 -(5)
December 2016	59.07 +1.42 NS -	60.03 +2.20 NS -	62.83 +3.34* -	62.07 +4.69** -
January 2017	65.07 +4.01****	70.50 +.1.08***	68.17 +2.38***	73.97 +4.64***

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	-	-	-	-
February 2017	67.50 +3.42*** -	67.20 +1.06*** -(4)	60.53 +1.12 NS -	68.70 +3.93*** -
March 2017	64.67 +4.02** -	59.95 +4.56 NS -(4)	61.83 +2.79 NS -	65.17 +3.73*** -
April 2017	63.23 +2.10* - (3)	53.50 +3.01* -(4)	48.33 +2.29*** -(5)	67.00 +3.34*** -(3)

Values expressed as Mean $\pm$ SE

* P>0.025, ** P>0.01, *** P>0.005, NS - Not significant

Figures in parentheses indicate number of birds

Significance test - November 2016 Vs other months

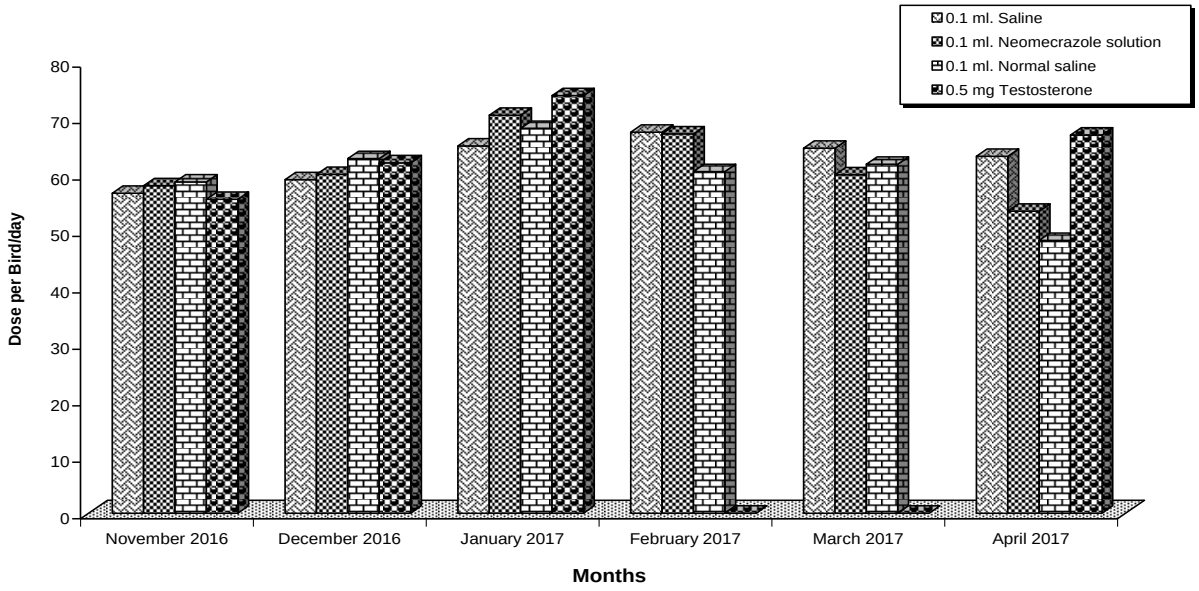

Fig. No. 1 : Showing the effect of Neomercazole (in normal birds) and Testosterone (in castrated birds) on the mean body weight ((M+SE) of male Rain quails, (*Coturnix-coromandelica*)

On day of termination of the experiment i.e. April 2017, the birds were weighed. Food and water was freely available to all the birds through out the experiment. The data was analysed statistically by student's 't' test. Body weight was compared (November Vs other months)

Results

The mean body weight in gms (M$\pm$SE) of different groups is represented in the tabular form.

As compared to November, group I and II birds exhibited fast rise (P>0.005) in body weight during January and February. During December, though body weight increased, but not significantly. In March, the increase was significant (P>0.01) in group I whereas insignificant in group II. Marginal (P>0.025) elevation and reduction occurred in body weight during April in group I and II respectively.

The third group which consists of castrated birds receiving 0.1 ml. of 0.9% normal saline showed highly significant (P>0.005) increase and decrease during January and April respectively, in December slight (P>0.025) and in February and March non-significant increase in body weight table was found when compared to November.

Castrated group treated with 0.5 mg testosterone (group IV) led to a fast significant (P>0.005) rise in body weight which lasted through out the experiment when comparison was made with November. The increase was of lesser significance (P>0.01) during December.

In all the groups maximum body weight was recorded in January except in control group which showed maximum body weight in February.

During January-April maximum mean body weight was recorded in group IV. During December both the castrated groups showed approximately same mean body weights.

The minimum mean body weight was recorded in group I (Table 1 and Text Fig. 1) during December and January while in February and April, it was found in Group III. In March, group II exhibited minimal mean body weight out of all the four groups.

Discussion

In wild birds, made hypothyroidic, increase in body weight has been recorded Woitkewitsch. 1940; Garg and Thapliyal, 1967; Wieselthier and van Tienhoven, 1972). Goodson *et al.,* (2005) investigated that bird behaviour is influenced not only by external factors but also by neural and harmonal influences. Jasnow A.M. *et al.* (2000) found that short day increases in aggression are inversely related to circulating testosterone concentrations in male siberian hamsters.

Our data demonstrate that testosterone exerts stimulatory effects on the body weight of castrates. Body weight of chemically thyroidectomized birds started increasing from November to January and declined from February to April. In birds of many species gonadal (Yokoyama, 1977) and thyroidal (Thapliyal, 1978) hormones are lipogenic and hence elevate the body weight of the birds. Matsunaga *et al.* 2002 studied androgen biosynthesis in brain of quail. K.K. Soma (2006) studied the relation between testosterone and aggression. Chemical thyroidectomy in Indian finches leads to increase in the body weight, since T_3 is well known for efficient landing of food stuffs. It could he cited that lipogenic mechanism cease to respond from February to April and thus decreased the body weight of chemically thyroidectomized birds. During November to January lipogenic mechanism was/were sensitive to altered activity and levels higher than available endogenously were beneficial for body weight growth. It indicate that certain levels of thyroid hormone(s) are essential for body weight growth. Interestingly, during February to April, chemical thyroidectomy led to decrease to initial level of intacts. It indicate that similar to hypothalamohypophyseal axis, lipogenic mechanism(s) had grown sensitive to altered thyroid activity. In Bunting response of lipogenic mechanism(s) to thyroidectomy depended upon lipid reserves at the time of thyroid removal. Along with reproductive behaviour year found terrestorial aggression in tropical birds is influenced by testosterone as observed by Hau *et al.* 2000. Studies of the North American song sparrow (Melospiza melodia) during the breeding season reveal that not only does testosterone increase aggression, but aggressive interactions also increase plasma testosterone levels. There is a rich variety of social organizations from colonial to strictly territorial, permitting comparative

studies of aggression and physiological mechanism (Soma and Wingfield, 1999; Goodson J.L. *et al.* 2005 and Brenowitz, E.A. 1997). In subsequent field studies, the temporal pattern of testosterone titres differed from laboratory studies, and testosterone concentrations were higher in wild caught sparrows.

Testosterone induced body weight gain in castrated birds, in contrast to the spotted munia where testosterone induced body weight gain in intact birds but not in either thyroidectomized or castrated birds. This seems to suggest that in the Rain quail the somatotrophic action of testosterone, apart from other factors, also depends on the presence or absence of gonads, as well as on the physiological status of birds. These results are comparable to the findings on some avain species related to anti and pro-testicular effects of exogenous testosterone (Pandha & Thapliyal 1964). The relationship between breeding behaviour in male black tailed galls and hormonal control due to testosterone has been studied by (Kazama *et al.* 2011. Weng *et al.* 2008) found that the hypothyroidism induced by methimazole caused a significant decrease in body and testes weight; the plasma levels of FT3-FT4 and TT4 significantly decreased, and the hypothyroid quail possessed a greater number of small follicles and more follicules epithelial cells in the thyroid gland.

Nevertheless, the results of the present study clearly indicate that antithyroid drug and testosterone will have a differential effect on the body weight and that the same amount of hormone may have different effects during different time of a year.

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