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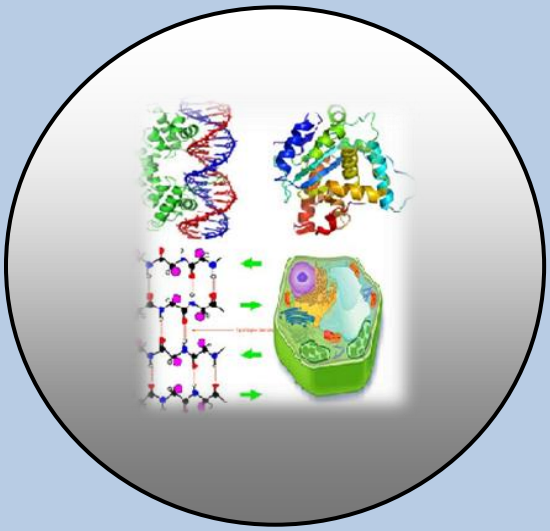

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RESEARCH PAPER

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Physiobiological Responses of Mice Given Various Doses of Testosterone

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ABSTRACT

Growth rate of animal including secondary sex organs is much affects by androgen hormone particularly testosterone. The hormone has an anabolic characteristic and forms protein for some sorts of muscles which would affect the growth rate in general or meat production specially. An experiment about physiobiological responses of mice given various doses of testosterone was conducted for 4 weeks at Denpasar.

The aim of the experiment was to study the testosterone doses which may result the best physiobiological responses included: a) performance (live weight, gain weight), b) development of secondary sex organs (testes weight, testes length, seminal vesicle weight and length), c) aggressiveness and d) death rate among the treatments.

Experimental design used was completely randomized design with 3 treatments (A = control, B = 0.2 cc of testosterone, C = 0.4 cc of testosterone) and each treatment consists of 3 replicates. Each replicate consists of 3 mice. Thus, total amount of mice used were 27 heads. Data obtained were analyzed with analysis of variance.

Results of the experiment showed that the mice with treatment B (0.2 cc of testosterone) produced better performance and development of secondary sex organ particularly testes than the others.

Key words: Testosterone, Performance, Secondary Sex Organs, Death Rate and Mice.

INTRODUCTION

Testosterone is produce by Leydig cells. It is an androgen hormone with a special function for stimulating sexual activity on male animals (Hill, et. al., 2008). It also has other function as follows: 1). to increase nitrogen (N) retention in muscles through several of enzymes (Tolihere, 1985), 2). To increase libido or biological needs (Yupardhi, 2013), and to form

muscles (Buttery at al., 1978) and long bounds (Asdell, 1957), 3). To increase growth rate and secondary sex organs i.e. scrotum /testes, moustache, beard (Mainwarning, 1979 and Hawker, 1978), 4). To increase the thickness of muscle fibers and it's strengthened (Nalbandove, 1976).

Physiologically, that the growth rate is an alteration of body organs dimension simultaneously i.e. weight gain, body weight etc. Moyes and Schulte (2008) said that the growth rate of an animal is affected by species, sex, age, feed, environment, genetic potential, hormones etc. Testosterone hormone can be administrated trough intramuscular injections or oral. In a certain level (depend on sort of animals), the hormone causes aggressiveness (http//: www.scientificamerican.com /article / strong-but-true-testosteron-alone-doesn't-cause-violent).

Refer to the information mentioned above; an experiment by using testosterone to increase the physiobiological (performance, secondary of sex organs, activities, and death rate.) was conducted at Denpasar. The objectives of the experiment were to study the performance of the animals (live weight, weight gain), the development of secondary sex organs (weight and length of testes and seminal vesicle), activity/aggressiveness, and death rate.

MATERIAL AND METHODS

Material

Twenty seven male mice on the age of 3 months were used in this experiment. The experiment was conducted for about 1 month (17 February – 14 March 2014) at the Laboratory of Animal Anatomy and Physiology, Faculty of Animal Science, Udayana University, Denpasar. Every 3 animals were kept in a cage which were made of plastic and wire and completed with feed and water places. All of the animals were fed with the same feed, Charoon Phokpand 511 *ad.lib*. as well as drinking water.

Methods

The design of the experiment was Completely Randomized Design (Snedecor and Cochran, 1980). It consists of 3 treatments as follows: A (control = no testosterone), B (0.2 cc of testosterone), and C (0.4 cc of testosterone). Each treatment consists of 3 replicates and each replicate consists of 3 animals. The testosterone was injected intramuscular. Variable measured were initial weight, live weight, gain weight, testes weight, seminal vesicle weight, seminal vesicle length, activities, and death rate. Data were analyzed with analysis of variance/ANOVA (Snedecor and Cochran, 1980). If there is a significant different among the treatments, it will be continued with Duncan Multiple Range Test (Steel and Torrie, 1990). During the experiment observation on physical activities/aggressiveness and death rate of each animal were conducted at any time but, weighed once a week. At the end of the experiment there were 30% sample of each treatment was slaughtered for measuring weight and length of testes and seminal vesicle.

RESULTS AND DISCUSSION

The animals with treatment B (0.2 cc of testosterone) resulted the highest live weight and gain weight and significantly different ($P < 0.05$) than that the animals with treatment A (control = no testosterone) and C (0.4 cc of testosterone) (Table). This may caused by the doses for 0.2 cc of testosterone was very effective to increase the growth rate of the animals than the others.

From physiological aspects, the testosterone has an anabolic affects which is very important in metabolism of protein. The testosterone stimulates the formation of the protein. The testosterone such that characteristic would enlarge mass of body muscles (Genuth, 1983). So that, the testosterone increases the growth rate. That statement was supported by Keele et al. (1982) and Yupardhi (1997) that the testosterone is a growth hormone. It works on secondary reproduction (sex) organs i.e. testes (produces sperm on its epididymis, Rizal et al., 2004), seminal vesicle etc. According to Isnaeni (2006), the hormone also functions to form sperm and involve in characteristic of secondary sex organs. In fact that the animal with treatments B and C resulted higher weight and longer (dimension) of testes and seminal vesicle respectively ($P < 0.05$) than that the untreated animal (A = control) (Table). The result was supported by Leshner (1978) that in protein metabolism the testosterone functions is to compose muscles at some parts of the body including testes and seminal vesicle. Similarly, Nalbandov (1964) also reported that androgen hormone especially testosterone could increased the amounts and thickness of the muscles. Those may results the testes and seminal vesicle of the animals treated with testosterone were significantly different ($P < 0.05$) than the other.

Table Physiobiological Responses of Mice Given Various Doses of Testosterone.

Variables	**Treatments**		
	A (Control)	B (0.2 cc testosterone)	C (0.4 cc testosterone)
Initial weight (g/head)	26.00 ^{a}	25.33 ^{a}	27.33 ^{a}
Live weight (g/head)	35.00 ^{ab}	35.67 ^{a}	33.33 ^{b}
Gain weight (g/head)	9.00 ^{a}	10.34 ^{b}	6.00 ^{c}
Testes weight (cm/head)	0.19 ^{a}	0.26 ^{b}	0.20 ^{a}
Testes length (cm/head)	0.7 ^{a}	0.8 ^{b}	0.8 ^{b}
Seminal vesicle weight (g/head)	0.18 ^{a}	0.30 ^{b}	0.48 ^{c}
Seminal vesicle length (cm/head)	2.30 ^{a}	2.00 ^{b}	2.80 ^{c}
Aggressiveness (times/day.)	0.7 ^{a}	2.0 ^{b}	3.0 ^{c}
Death rate (%)	0.0	0.0	0.0

Values in the same rows bearing similar scripts letter were not statistically significant ($P > 0.05$).

As a comparison, Gooding (1978) reported that activity of bulls was higher than steers. That was caused by higher level of the testosterone on the bulls than that of the steers. Similarly, it was also occurs on male mice treated with 0.4 cc testosterone (treatment C). Their activities/aggressiveness showed much higher ($P < 0.01$) than others (treatments A and B) (Table). That may due to libido concentration increases in their blood; so, the animals become more aggressive. The testosterone is only one of many factors that influence aggression (http://en.wikipedia.org/wiki/Testosteron#Aggressionandcriminality).

This really wise a lot of energy particularly to fulfill their biological needs. It consequences, hypertrophy and hyperplasia of cells throughout physiological and biological processes in the body were also become less (Yupardhi, 2013). Therefore, the growth rate of the animal was slower than the less aggressive one.

During the experiment, there was no any animal death. Therefore, its data no needs to be analyzed (Table).

CONCLUSIONS

From the descriptions mentioned above could be concluded that the animals treated with 0.2 cc of testosterone (treatment B) resulted the performance and development of secondary sex organs particularly testes were better and significantly different than the others.

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