

EFFECT OF TESTOSTERONE ON THRESHOLD OF PAIN

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Summary : Pain threshold for thermal stimulus was studied in male albino rats before and after three days of treatment with testosterone. It was also determined 15 days after castration and three days after testosterone treatment of castrated rats.

There was a significant reduction in pain threshold after testosterone treatment and a marked increase in pain threshold after castration. This increase disappeared after administration of testosterone to the castrated rats.

Key words: testosterone castration thermal stimulus

INTRODUCTION

Endocrinal and metabolic changes follow castration. Vas deference has been reported to respond less to α -adrenoceptor agonists after castration which effect can be prevented by testosterone treatment (3). It is thus speculated that there may be some relationship between hormonal status and pain threshold. The object of the present study was to examine the effect of castration on pain threshold and relation of sensitivity to painful stimulus with the body testosterone-status.

MATERIALS AND METHODS

Ten adult male albino rats weighing between 150 to 250 g were selected. Following the method described by Bonnycastle (1) and using analgesiometer (Techno Electronics, Lucknow) tail withdrawal time on thermal stimulus was determined. The mean of three readings daily for three consecutive days (total 9 readings) was taken.

The rats were then treated with testosterone (Inj. Testoviron 25 mg/ml - German Remedies), 1 mg/kg body weight, im, for three days and the tail withdrawal time was noted daily from the second day of treatment for 3 days. The mean of 3 days' readings constituted the reaction time of the testosterone-treated rats. It was found in preliminary experiments that the influence of testosterone started 24 hr after the treatment and continued for 24 hr after the withdrawal.

Seven days after the last testosterone injection castration was performed under ether anaesthesia. The tail withdrawal time was determined daily for 3 days beginning from

the 16th day after the castration. Then these rats were treated with testosterone, 1 mg/kg (im) for three days. The tail withdrawal time was again noted from the second day of treatment for three days

RESULTS

The results are shown in Table I. There was a significant decrease in the tail withdrawal time after testosterone treatment. It was markedly increased after castration. Testosterone treatment, however, restored it to the precastration level.

TABLE I : Effects of testosterone in normal and castrated rats and effect of castration on thermal pain threshold.

S.N.	Treatment	No. of rats	Mean tail withdrawal time in seconds \pm S.E.M.	t value	P value
1	Nil (control period)	10	6.3 \pm 1.2	—	—
2	Testosterone 1 mg/kg (im) for 3 days	10	5.2 \pm 0.78	4.9	<0.001
3	After castration	10	12.9 \pm 1.7	11.5	<0.001
4	Castration + Testosterone as in (2)	8	6.1 \pm 0.61	11.8	<0.001

Comparisons were made between 1 and 2, 1 and 3, and 3 and 4.

DISCUSSION

Response to pain is known to vary from person to person and in the same person at different times. It is conceivable that the threshold for pain depends upon many factors and one of them may be the hormonal status. Mangat *et al.* (2) reported that testosterone administration in conscious monkeys caused inhibition or potentiation of evoked responses of different regions of the brain in a specific manner. Genito sensory motor cortex exhibited potentiation of evoked responses. Accordingly they proposed testosterone and genital afferent input as playing selective role in brain mechanisms. The observations in the present study suggest the existence of a relationship of testosterone to one type of pain threshold i.e. thermal; testosterone decreases threshold to pain while lack of it enhances the threshold.

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