

THE INTERACTION EFFECT OF PRIOR SEXUAL EXPERIENCE AND TESTOSTERONE PROPIONATE TREATMENT ON SEXUAL BEHAVIOR IN MALE RATS

Hsiao-Yuan Lee, George Kan-hwa Ho

Department of Psychology

National Chengchi University

Male rats with previous sexual experience to test the effects of Testosterone Propionate was studied. It was found that only with the maturation of psychomotor neural system can hormone function optimally.

INTRODUCTION

The copulatory behavior in male rats may be viewed as consisting of at least three components: (1) the initiation performance when a receptive female rat was introduced, the male approaches and engages in a series of mounts, (2) the intromission pattern with the penis thrust into the vaginal duct of the female, (3) an ejaculation pattern may be induced after a period of mounts and intromissions. Although all of these three behavior patterns and other behavioral components are not wholly hormone-dependent (because castration is not followed by an immediate disappearance of this behavior), they are physiologically a testosterone-dependent process (1). Following the treatment of Testosterone Propionate (TP) to castrated adult male rats, they displayed more sexual behavior patterns compared to the control group (oil-injected group).

Besides the testosterone function in the maintenance of mating behavior in male rats, previous experience may play another important role, male rats with sexual experience before castration exhibited more prolonged retention of sexual behavior than inexperienced animals, though there was no definite study conducted on rats, an early experiment by Rabedean and Whalen (2) demonstrated no effects of experience on sexual performance. Bloch and Davidson (3) also showed no significant difference was found between their sexual performance of experienced and inexperienced rats except the longer intromission latency in latter.

The Interaction Effect of Prior Sexual Experience and Testosterone Propionate Treatment
on Sexual Behavior in Male Rats

The present investigation was conducted to examine the effects of previous sexual experience on the sexual behavior, the facilitation of sexual behavior by exogenous testosterone in male rats, and the interaction of testosterone and experience synergistically to facilitate the copulatory behavior of intact male rats.

METHOD

Animals:

25 adult Sprague-Dawley male rats (90 day-120 day old) born in this laboratory were used. Animals were weaned at day 30 and then 10 of them were housed in the bisexual cages and shown to have displayed ejaculation pattern (sexually experienced group), the other 15 were housed two in each cage with the same sex. In experienced group, 10 subjects were divided into two groups, in Group E-TP(X), subjects were not injected with Testosterone Propionate, in Group E-TP(100) subjects were with daily injection of 100 ug TP subcutaneously per day for one week, the 15 subjects were divided into three groups, in Group NE-TP (500) subjects were injected with 500 ug TP per day for one week, in Group NE-TP (300) accordingly and in Group NE-TP(X) without any treatment as control.

Procedures:

All behavior testings were carried out on the following day after final TP injection, subjects were put a in glass aquarium (50 × 25 × 30cm) with shavings on the floor. Animals were allowed to adapt to the test cage for 5 min prior to the introduction of the stimulus females (stimulus females were injected with 3 ug of Estrogen 41 hr before the test and 500 ug of progesterone 5 hr before the behavior testing).

All animals were given a 30 min interval for behavior testing one time, and the following sexual behavior patterns were observed and recorded:

Mounting: mount with pelvic thrustings.

Intromission: mount with pelvic thrusts followed by a deep thrust and a rapid dismount which was usually followed by genital grooming. Ejaculation: vigorous mounting with thrusting followed by a deep thrust with a slow dismount and genital grooming.

Latency for the first mount: the time interval between the introduction of the stimulus females and the first mounting displayed by the males.

RESULT AND DISCUSSION

Table. 1. Mean behavioral scores of experienced and inexperienced subjects with or without TP treatment. All scores were averaged through all tests during the experiment.

Treatment	N	MF	IF	EF	ML
1. E-TP (100)	5	26.6±3.08*	16.0±1.71*	3.20±0.58	141.2±38.55**
2. E-TP (X)	5	11.2±4.12	3.40±1.42	1.20±0.45	175.6±44.21**
3. NE-TP (300)	5	9.00±4.42	7.00±3.35	2.00±1.37	485.8±62.98
4. NE-TP (X)	5	7.80±4.28	4.40±2.71	1.20±0.58	443.8±120.57

*: significant at 0.01 as compared with the NE-TP Group

** : significant at 0.01 as compared with the NE Group

N: number of subjects in each group

MF: mount frequency

EF: ejaculation frequency

IF: intromission frequency

ML: mounting latency

Mean±Standard Error

Statistical Treatment:

Analysis of variance and correlated 2-tailed t-test.

The percentages of animals which showing the ejaculatory reflex among all mounting test was no difference between experienced and inexperienced group (11.1% to 18%). As shown in Table 1, significant increase was found in experienced group in mounting frequency ($p < 0.05$, $t = 3.01$) intromission frequency ($p < 0.01$ $t = 2.48$) and ejaculation frequency ($p < 0.05$ $t = 2.51$) as compared with the inexperienced animals, also a significant decrease in mounting latency of the former ($t = 4.72$, $t = 4.03$). In groups injected with testosterone 100 ug, 300 ug or 500 ug, the subjects with prior experience displayed higher behavior frequency (both mounting and intromission, $p < 0.01$) than inexperienced group significantly, which invariably demonstrated that the maturation and development of psychomotor neuron is essential for normal behavior expression and physiological process phylogenically.

Hormones can function normally and facilitate behavior only to those animals with mature neural system.

The shorter mounting latency in experienced group also indicated that the learning process may be involved in the obtaining of sexual behavior and prior experience caused faster approach to vaginal area and mounting responses subsequently.

In comparison of all groups, subjects with experience and injected with 100 ug TP displayed higher frequency of sexual behavior than that of any other group. This showed the special effect of exogenous testosterone (when compared with that of endogenous testicular hormone) on sexual performance. This finding was also in agreement with our hypothesis that only with the synchronization of maturation and hormone can sexual behaviors be performed optimally.

The Interaction Effect of Prior Sexual Experience and Testosterone Propionate Treatment
on Sexual Behavior in Male Rats

REFERENCES

1. Beach, G. A.; "Hormones and Behavior"; New York, Hoeber, 1948.
2. Rahedean, R. G. and R. E. Whalen; "Effects of Copulatory Experience on Mating Behavior in the Male Rat"; J. com physiol psychol. vol. 52, 482-484, 1959.
3. George J. Bloch and Julian M. Davidson; "Effects of Adrenalectomy and Experience on Postcastration Sex Behavior in the Male Rat,; Physiol and Behavior, vol. 3, 461-465, 1968.