SHORT COMMUNICATION

EFFECTS OF CANNABIS EXTRACT ON THE RESPONSE OF ACCESSORY SEX ORGANS OF ADULT MALE MICE TO TESTOSTERONE

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Summary: Cannabis extract caused a marked reduction in the body weight and in the weights of seminal vesicles, ventral prostate, epididymis, preputial gland and perineal complex (Penis and its bulb and levator ani muscle) of castrated adult male mice. Cannabis extract administration in combination with testosterone propionate (TP) inhibited growth stimulation produced by TP alone. Anti-androgenic nature of the compound is suggested.

Key words: Cannabis extract testosterone sex accessory organs

Marihuana is a crude preparation of flowering tops, leaves, seeds and stems of female plants of Indian hemp, *Cannabis sativa* L. Our earlier observations in male mice indicated that cannabis extract administration inhibits androgen production, Dixit *et al.* (1). This prompted us to examine the anti-androgenic nature of the compound.

The studies presented here are concerned with the direct effects of cannabis extract on the target organs, hence castrated mice receiving exogenous androgens have been used to eliminate most of the effects mediated through the release of testicular hormones.

For the bioassay of androgenic activity of cannabis extract in mice, the weight response of seminal vesicle and other accessory sex organs has been used.

Authenticated samples of *Cannabis sativa* were extracted with 98% alcohol in a Soxhlet apparatus for 4 hrs. The extract was evaporated to dryness and the residue weighed and redissolved in a mixture of alcohol, tween 80 and distilled water (10 : 1: 89) to make a concentration of 10 *mg/ml*. The activity of the extract was assayed by the classical rabbit corneal anaesthesia method of Gayer (3); it proved to be a potent preparation giving complete corneal areflexia 5 minutes after intravenous injection (0.5 *mg/kg*).

Forty mice used were castrated males of swiss albino strain fed on *ad lib* diet of Purina Chow (Hindustan Lever Private Ltd.) and water. The mice were castrated one week before the beginning of the experiments and were divided into groups of ten each and were treated as outlined in Table I. The castrated controls received the vehicle alone. All animals were sacrificed twenty four hours after the administration of the final dose of cannabis extract/testosterone alone

TABLE I: Changes in body weight, the weights of thyroid, adrenal, thymus, testes and accessory sex glands in castrated mice injected with testosterone propionate (TP) alone, or in combination with cannabis extract.

Group	*Treatment*	*Body wt g*	*Thyroid wt mg/100g body wt*	*Seminal vesicle mg/100g body wt*	*Ventral prostate mg/100g body wt*	*Epididymis wt mg/100g body wt*	*Adrenal wt mg/100g body wt*	*Penis wt mg/100g body wt*	*Thymus wt mg/100g body wt*	*Levator ani-muscle mg/100g body wt*	*Preputial wt mg/100g body wt*
1.	Castration (30 days) (10)	30 ± 3	9.2 ± 0.3	164 ± 12	12.1 ± 2.7	165 ± 17	14.9 ± 2.3	296 ± 29	76.5 ± 11.3	76.2 ± 5.7	163.1 ± 18.1
2.	Castration + Cannabis extract (60 *mg*) (10)	25 ± 4	8.0 ± 0.7**	64.5 ± 11.5†	8 ± 3.1†	61.2 ± 9.1†	30.9 ± 4.1†	160 ± 17†	48.1 ± 8.7†	37.2 ± 7.2†	58.4 ± 11.4†
3.	Castration + Cannabis extract (60 *mg*) + TP (6 *mg*) (10)	31 ± 3	9.0 ± 1.0**	388 ± 36*	10.5 ± 2.5*	93 ± 19*	18.0 ± 2.4	318 ± 42	64.5 ± 13.5	52.5 ± 11.9*	131 ± 16.4*
4.	Castration + TP (6 *mg*) (10)	33 ± 2	8.5 ± 0.3**	893 ± 28	25.9 ± 3.7	174 ± 37	14.1 ± 1.9	447 ± 49	40.3 ± 9.1	86.3 ± 13.1	207 ± 23.1

† $P<0.01$ compared with group 1
* $P<0.01$ compared with group 4
** Not significant compared with group 1

Figures in parentheses represent the number of animals examined.
All figures ± S.E.M.
2 *mg* cannabis extract/day for 30 days; 0.25 *mg* TP/alternate day total dose 6 *mg*.

or in combination. Cannabis extract was administered intraperitoneally, whereas testosterone propionate injections were made subcutaneously in the scapular area, on alternate days.

For each animal, determinations were made of body weight, and organ weights of thyroid, adrenal, seminal vesicles, ventral prostate, epididymis, preputial glands and perineal complex (Penis and its bulb and levator ani muscle).

Organ weights: The results are shown in Table I. The cannabis extract caused a marked reduction in the body weight and in the weights of seminal vesicles, ventral prostate, epididymis, preputial gland and perineal complex (penis and its bulb and levator ani muscle) (Table I, group 2). The weight of thyroid gland did not change, whereas the adrenal gland weight increased significantly ($P > 0.01$). Thymus gland involution was conspicuous.

Testosterone administration (6 *mg* total dose) alone, significantly increased the weight of the seminal vesicle (Table I, group 4). When testosterone was administered in combination with cannabis extract (10: 1 ratio) the stimulatory response to TP was effectively blocked (Table I, group 3 compared with group 4).

In screening compounds for anti-androgenic ability, measurement of the suppression of response of seminal vesicles, ventral prostate, epididymis, preputial gland and perineal complex to testosterone as determined by weighing would be useful procedure (3).

In the present investigation TP had a stimulatory effect on sex accessory organ growth. Cannabis extract administration in combination with TP inhibited this growth.

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