Influence of pretreatment with testosterone and nandrolone on the reactivity of guinea-pig isolated seminal vesicles to angiotensin and tyramine

It was previously reported (Gascon & Walaszek, 1969) that neither angiotensin nor tyramine stimulates the guinea-pig isolated seminal vesicle. When tested after the addition of adrenaline, however, both compounds induce in this smooth muscle a contraction which is followed by rapid tachyphylaxis.

We now report the influence of chronic treatment with testosterone propionate and nandrolone propionate on the reactivity of guinea-pig isolated seminal vesicles to angiotensin and tyramine.

Male guinea-pigs, 200–225 g, were divided into four groups. Animals in the first and third groups were injected intraperitoneally daily with testosterone (8 mg/kg) and nandrolone (2 mg/kg), respectively, while those in the second and fourth groups served as controls. The influence of testosterone and nandrolone was evaluated on individual groups of 3 animals each day for 7 days of treatment. 24 h after the last injection, the seminal vesicles were suspended at 37° in a 10 ml bath containing Krebs-Henseleit solution gassed with 5% carbon dioxide in oxygen and the reactivity of the organs from treated animals to each agonist was compared with that of the controls.

No difference was observed between the reactivity of the seminal vesicles of the treated animals and those of the controls after the first 4 days of pretreatment with testosterone. In such preparations, angiotensin and tyramine whether alone or in combination, failed to stimulate the isolated smooth muscle. However, after pretreatment with testosterone for 6 days, the agonists induced contraction of the seminal vesicles (Fig. 1).

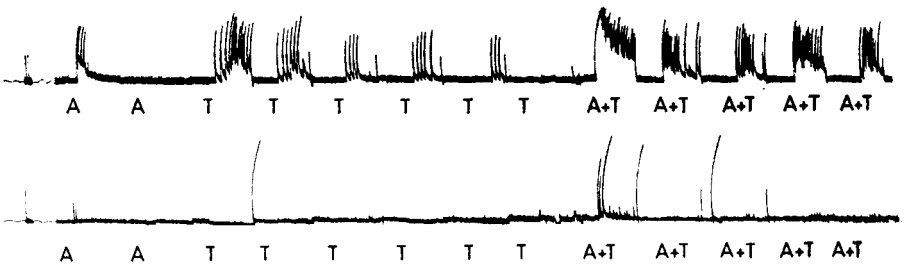

FIG. 1. Influence of pretreatment with testosterone on the reactivity of the guinea-pig isolated seminal vesicles to angiotensin and tyramine. A, Angiotensin 10 μg/ml; T, Tyramine 20 μg/ml. Upper tracing: seminal vesicle of a pretreated animal (6 days). Lower tracing: seminal vesicle of a control animal.

Similar results were observed after pretreatment with nandrolone, the only difference being that modification of the reactivity of the seminal vesicles of animals receiving nandrolone became evident after 4 days pretreatment. The contractions induced by either angiotensin or tyramine in preparations taken from pretreated animals showed tachyphylaxis and were abolished by phenoxybenzamine. On the other hand, the effect induced by the combination of angiotensin and tyramine was antagonized by desipramine (2×10^{-5}M) (Fig. 2).

The mechanism by which testosterone and nandrolone produce this modification of reactivity is not clearly understood. It was recently reported that the contraction induced in normal seminal vesicles by angiotensin and tyramine after the addition of adrenaline is entirely mediated by a release of catecholamines from extraneuronal stores (Gascon & Walaszek, 1969). In the present study, both agonists were able to stimulate the seminal vesicles of the treated animals even when adrenaline was not

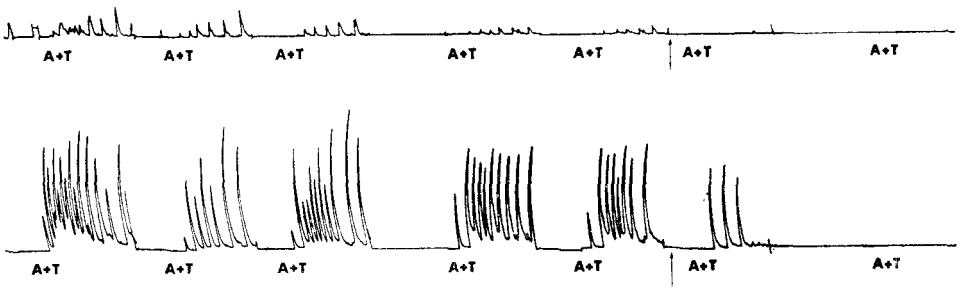

FIG. 2. Effect of pretreatment with nandrolone on the reactivity of the guinea-pig seminal vesicle to the combination of angiotensin and tyramine: influence of desipramine. A, Angiotensin 10 μg/ml. T, Tyramine 20 μg/ml. At ↑, desipramine (2×10^{-5}M) was added to the perfusion mixture. Upper tracing: seminal vesicle of a control animal. Lower tracing: seminal vesicle of a pretreated animal (5 days).

previously added. This observation, and the fact that the stimulant activity of both agonists was abolished either by phenoxybenzamine or by desipramine, indicates that we may be dealing with a release of endogenous catecholamines. If this is so, the site of action is probably located at the nerve endings, since Sjöstrand (1962, 1965) showed that in the seminal vesicles most of the catecholamines are stored in adrenergic nerves as noradrenaline. From these results, it may be concluded that pretreatment with testosterone and nandrolone induces some modification in the noradrenaline content of the seminal vesicles or in the distribution of the biological amine, making it more available for release by angiotensin and tyramine. This type of action has been observed in the uterus and vagina of rats after pretreatment with oestrogens (Sjöberg, 1967; Spratto & Miller, 1968a,b).

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Department of Pharmacology,
Faculty of Medicine,
University of Montreal,
Montreal, Canada.

A. L. GASCON*
J. BRODEUR
M. VAILLANCOURT†

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* Scholar of the Medical Research Council of Canada, † Fellow of the Medical Research Council of Canada.

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