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JOURNAL ARTICLE

Androgens modulate the alpha-adrenergic responsiveness of vascular smooth muscle in the corpus cavernosum

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Rat penile erection is an androgen-dependent process with castration leading to a loss of potency. The present study was designed to determine if one of the mechanisms by which androgens maintain the erectile response is the regulation of the alpha-adrenergic responsiveness of cavernosal smooth muscle. Electrical stimulation of the major pelvic ganglion (MPG) was used to elicit erection in untreated, castrated rats (CASTRATE) or castrated rats given testosterone replacement (TESTO). The effects of phenylephrine (an alpha 1-adrenergic agonist) and prazosin (an alpha 1-adrenergic antagonist) on the erectile response were investigated. Phenylephrine, when administered to both TESTO and CASTRATE animals during erection, resulted in a dose-dependent decrease in the intracavernosal pressure (CCP) with an ED50 value of 1.8 +/- 0.48 micrograms/kg BW for TESTO rats; in the CASTRATE animals, the ED50 was significantly reduced to 0.29 +/- 0.08 microgram/kg BW. The increases in mean arterial pressure (MAP) resulting from phenylephrine injection in TESTO and CASTRATE animals were of similar magnitude and were not significantly different. Prazosin administration resulted in an enhancement of the erectile response in CASTRATE but not in TESTO animals. Taken together these results demonstrate that the cavernosal vasculature in CASTRATE animals possesses increased reactivity to alpha-adrenergic stimulation as compared to the sensitivity in TESTO rats. Based on these findings, we conclude that one of the mechanisms by which androgens maintain erectile function is by regulating the alpha 1-adrenergic responsiveness of the cavernosal smooth muscle.

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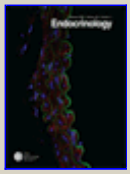

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