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JOURNAL ARTICLE

The effect of vasoactive intestinal polypeptide (VIP) on rabbit cavernosal smooth muscle contractility

Y. C. Kim, H. K. Choi, Y. S. Ahn, K. H. Kim, P. O. Hagen and C. C. Carson 3rd

Department of Urology, Yonsei University College of Medicine, Seoul, Korea.

Vasoactive intestinal polypeptide (VIP) has emerged as a possible candidate for a nonadrenergic, noncholinergic inhibitory neurotransmitter in penile erection. In this study, the effect of VIP and its relationship to the adrenergic and cholinergic mechanisms were examined using isolated corpus cavernosal strips from the rabbit penis. The mechanism of action of VIP on corporal relaxation was investigated with respect to the activation of cyclic GMP and the mobilization of calcium and potassium ions. VIP caused a dose-dependent relaxation of the cavernosal strip. Pretreatment with VIP had no effect on the contraction induced by norepinephrine, phenylephrine, and clonidine. VIP had no synergistic effect on the relaxation produced by acetylcholine or isoproterenol. Neither atropine nor propranolol had any blocking effect on the VIP-induced relaxation. Methylene blue decreased the VIP-induced relaxation of the cavernosal strip. VIP had no effect on the contraction induced by KCl at either 20 or 80 mM. In calcium-free high-potassium physiologic salt solution, VIP inhibited the calcium-induced contraction. These results suggests that the mechanism of action of VIP is not mediated through classical adrenergic and cholinergic neurotransmission on rabbit cavernosal strips, but that VIP may exert its action by the activation of cyclic GMP, which may be associated, in part, with the inhibition of calcium influx.

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