Pharmacological evidences that vasoactive intestinal polypeptide is not involved in non-adrenergic non-cholinergic relaxation in rabbit corpus cavernosum

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The putative role of vasoactive intestinal polypeptide (VIP) as non-adrenergic non-cholinergic (NANC) neurotransmitter has been studied in rabbit corpus cavernosum. In the presence of atropine and guanethidine the short and prolonged electrical field stimulation (EFS, 2~16 Hz) induced a frequency-dependent relaxation which was abolished by tetrodotoxin (0.3 μM), a nerve conductance blocker. The neurogenic relaxant reponses were not affected in the presence of VIP-inactivating peptidase, α-chymotrypsin (2 units/ml), whereas VIP-induced relaxation were completely abolished. Inhibition of nitric oxide synthase by N^G-nitro-L-arginine (10~100 μM) caused concentration-dependent inhibition to the neurogenic relaxant responses and at 100 μM the relaxations were virtually abolished. In contrast NO (3~30 μM) and VIP (0.001~1 μM)-induced relaxation were unaffected. The inhibitory effect of L-NNA was reversed in the presence of L-arginine (5 mM), the precursor of the NO biosynthesis. Hemoglobin (20~60 μM), sequestering NO in the extracellular space, abolished the NO-evoked relaxation and also caused a concentration-dependent inhibition to the neurogenic relaxation. These observation indicate that NANC relaxation induced by prolonged EFS of rabbit corpus cavernosum is also mediated mainly by nitric oxide as same as that of short EFS, and suggest that VIP is not involved in NANC relaxation of rabbit corpus cavernosum and NO would not be produced by VIP in this tissue.