The effect of exogenous dopamine on ileal smooth muscle of Guinea-pig

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摘要

Abstract

In the isolated ileum of guinea-pig, treatment with dopamine produced a lowering of muscle tone in a dose-dependent manner. Dopamine-induced relaxation at low concentration was reversed by haloperidol, the specific antagonist of dopamine receptors. The relaxations by dopamine induced at concentration of 1 microM or higher were abolished by haloperidol with propranolol. At the concentration sufficient to block beta-adrenoceptors, propranolol attenuated this relaxation by dopamine at high concentrations. Similar results were also observed in tissues concerning the dopamine-stimulated formation of cyclic AMP. Mediation of dopamine receptor and beta-adrenoceptor in this cyclic AMP-related relaxation can thus be considered. Failure of sulpiride, an antagonist of dopamine DA-2 receptors, to reverse the actions of dopamine ruled out the participation of DA-2 receptor. Otherwise, SCH23390, the blocker of dopamine DA-1 receptors, reversed the responses to dopamine at low concentration only. Actions of dopamine induced at high concentration were disappeared in the presence of SCH23390 with propranolol. Thus, the obtained data suggest that dopamine induced relaxation of ileal smooth muscle through an activation of dopamine DA-1 receptors and/or a stimulation of beta-adrenoceptors at the concentrations over 1 microM to result in an increase of cyclic AMP in guinea-pigs.