

Stimulatory effects of dopamine on acid secretion from the isolated rat stomach

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摘要

Abstract

The effect of dopamine (DA) on acid secretion was studied using the everted preparation of isolated rat stomachs. DA concentrations, measured by HPLC-ECD in the rumen, corpus and antrum were 1.06 nmol/mg protein, 0.49 nmol/mg protein and 2.92 nmol/mg protein, respectively. DA stimulated acid secretion at a concentration of 10 nM and elicited the maximum response at 10 microM, which was at a level approximately 1.56-fold that of the spontaneous secretion but only about half that of secretion induced by histamine at a concentration of 0.3 mM. The concentration-dependent stimulation by DA was antagonized by octopamine and SCH 23390. Failure of proglumide and cimetidine to affect this stimulation ruled out the participation of histamine and/or gastrin. Scopolamine and tetrodotoxin completely inhibited the acid secretion induced by low concentrations of DA but inhibited only partially the response induced by high concentrations of DA. The results obtained indicate that DA induces acid secretion via activation of the dopamine D1 receptor, located on the cholinergic neurons and on some nonneuronal cells, in the rat stomach.