



Role of cytosolic cAMP in secretin induced relaxation of gastric muscle cells of rat

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Abstract

AIM: Secretin is a peptide which inhibits gastrointestinal motility. It's not clear: (1) whether secretin had direct effect on rat isolated gastric smooth muscle cells; (2) whether specific receptors exist on gastric smooth muscle cells; (3) whether cytosolic cAMP was involved during relaxation of gastric muscle cells caused by secretin. The purpose of this study was to investigate action of secretin on antrum smooth muscle cells, and the post receptor signal transduction mechanism.

METHODS: Isolated gastric smooth muscle cells were prepared to observe the relaxing effect of secretin on gastric muscle cells, specific antiserum or receptor antagonists were used to investigate their

effects on the action of the peptides. Protein competitive binding assay was used to measure cAMP concentration changes after secretin was added.

RESULTS: (1) Secretin caused relaxation of both the body and the antrum. It relaxed the circular muscle cells while had no direct effect on longitudinal muscle cells. (2) Secretin antiserum (1:100) blocked the effect of secretin, adenylate cyclase activator forskolin (10^{-5} mol/L) potentiated while cAMP inhibitor (2×10^{-5} mol/L) antagonized the effect of secretin. (3) Secretin caused cAMP increase in gastric circular smooth muscle cells, Forskolin strengthened while cAMP suppressed intracellular cAMP increase caused by secretin.

CONCLUSION: (1) Secretin exerted direct effect on gastric muscle cells by specific receptors on cell membrane. (2) Relaxation of secretin on gastric circular muscle cells was caused by the increase of the intracellular cAMP after peptides binding to their receptors.

Key words: Cytosolic; cAMP; Secretin; Gastric muscle cells; Rat

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