The Stimulatory Effect of Cholecystokinin on Pancreatic Secretion in Man Is Modulated by the Cholinergic System

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The aim of the present study was to analyse the role of the cholinergic system on stimulation of pancreatic secretion in man by endogenous cholecystokinin (CCK) after a test meal and exogenous CCK after infusion of the CCK analogue caerulein.

Methods: In the first study 8 volunteers underwent 3 tests after swallowing a duodenal tube. The cholinergic antagonist atropine (5 µg/kg/h), the CCK antagonist loxiglumide (10 mg/kg/h), or saline were infused i.v. for 180 min. After 60 min of intravenous infusion a liquid test meal (Lundh meal) was perfused duodenally (2 ml/min) over a period of 120 min.

In the second study in 6 volunteers 3 tests were performed after swallowing a duodenal tube. Caerulein was infused in graded doses (3,3;10;30 ng/kg/h) for 45 min each. Concomitantly NaCl, atropine (5 µg/kg/h) or loxiglumide (10 mg/kg/h) were infused.

Pancreatic secretion was assessed by a marker perfusion technique (PEG 4000). Pancreatic enzymes (amylase, lipase, trypsin, chymotrypsin) were determined in 15-min fractions of duodenal aspirates. Plasma CCK and PP were measured by RIA.

Results: In the first study the CCK antagonist inhibited pancreatic enzyme output during stimulation by a test meal by 70% while atropine caused a 99% inhibition. In the second study the stimulatory effect of graded doses of exogenous CCK was inhibited by both atropine and the CCK antagonist by 85–90%.

In both studies, plasma levels of CCK were not influenced by atropine but were slightly increased after loxiglumide infusion. The increase in plasma PP concentrations after test meal stimulation and caerulein infusion was completely blocked by atropine and loxiglumide.