Somatostatin Analogues and Exocrine Pancreatic Secretion

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Key Words

Somatostatin
Octreotide
Exocrine
Pancreas secretion
Fistula
Acinar cells
Enzyme

Abstract

Subcutaneous injection of 50 µg octreotide before a meal can almost totally prevent the increase in exocrine pancreatic secretions caused by the meal. Octreotide inhibits plasma amino acid uptake by pancreatic acinar cells, and thus synthesis of pancreatic enzymes. This effect has clinical potential.

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Octreotide is a long-acting somatostatin analogue which has been shown to exert several inhibitory effects on the gastro-intestinal tract, including human exocrine pancreatic secretion. In studies performed using duodenal intubation, Kohler et al. [1] showed that octreotide inhibits pancreatic secretion of enzymes but not of total secretion volume or bicarbonate secretion. In three patients with high-output external pancreatic fistulas we assessed the effect of octreotide on pancreatic secretion induced by ordinary meals [2]. In all three, meal ingestion caused a marked and prolonged increase in pancreatic juice flow, and in bicarbonate and enzyme output. The subcutaneous injection of 50 µg octreotide before the meal almost totally prevented this increase (by about 90%). The inhibitory effect of octreotide on postprandial pancreatic secretion appeared rapidly, and persisted for the duration of the study period (8 h). The reason for the discrepancy between the results of Kohler et al. [1] and our results concerning the effect of octreotide on total secretion volume and bicarbonate output is not clear; however, it should be pointed out that while we evaluated the effect of octreotide on pure pancreatic juice, Kohler et al. [1] studied this effect on duodenal aspirate, which is a mixture of various digestive secretions. Moreover, other studies of the effect of octreotide on pure pancreatic secretion have found that the peptide inhibits all components of this secretion [3].

In a subsequent study carried out to clarify the mechanism of the inhibitory effect of octreotide on pancreatic secretion, we have shown that this peptide can inhibit the plasma amino acid uptake by pancreatic acinar cells and, consequently, the synthesis of pancreatic enzymes [4]. Clinically, this effect could be useful in the treatment of various pathological conditions of the pancreas in which it would be

desirable to suppress acinar cell activity and avoid accumulation of enzymes in pancreatic cells.

In conclusion, octreotide is a potent inhibitor of human exocrine pancreatic secretion. This inhibitory effect has important clinical implications in the treatment of pancreatic fistulas and pancreatic pseudocysts [5, 6].

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