

## **МЕДИКО-БИОЛОГИЧЕСКИЕ НАУКИ**

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### **THE SELECTION OF BRAKING PANCREATIC ENZYME ENDING IN THE INTRADUODENAL AMYLASE INTRODUCTION**

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**Introduction:** The removal of pancreatic juice from the duodenum increases the secretion of the pancreas, and the reverse introduction of juice inhibits it. The mechanism of this effect has been the subject of lively discussion for many years. The study of this issue is not only theoretical, but also of practical importance, including for improving the methods of functional diagnostics and replacement enzyme therapy. Thus, based on the accumulated data, it can be assumed that during continuous aspiration of the pancreatic juice probe from the duodenum, the hypersecretory reaction of the gland appears if secretion is caused by the introduction of a stimulant (eg hydrochloric acid) and is absent if it is caused by parenteral administration of secretin with pancreasimine. Most researchers have an effect of inhibition of secretion associated with the action of trypsinogen or its hexapeptidic fragment on the endocrine apparatus of the duodenum. However, it is said that oral administration of amylase reduces the amylolytic activity of rat pancreatic homogenate.

**Objective:** Based on the general principle of regulation of the enzyme-producing activity of the digestive glands, it was assumed that its inhibition is differentiated depending on the fermentative activity of the duodenal contents. We conducted a study to determine the effect of increased amylolytic activity of duodenal contents on pancreatic secretion.

**Material and methods:** The experiments were performed on 5 mongrel dogs weighing 12-15 kg. Anesthesia (droperidol, aminazin, hexanal) was performed under controlled breathing (apparatus DP-8). To collect pancreatic juice, the main pancreatic duct was cannulated, a ligature was placed on the minor duct at the site of the pyloric sphincter, and in the initial part of the duodenum, a catheter was strengthened with a suture for insertion of a secretion stimulator. Blood and urine were collected through catheters inserted into both the ureter and femoral vein. To stimulate secretion, intrauteronodenal administration was administered in 1 hour for 8-10 ml of 0.1N hydrochloric acid solution, then every 15 minutes for 8 hours, 8-10 ml of hydrolysin acidified to pH 2. After 2 hours, 0.2 mg% solution (10 ml / h) of the enzyme preparation amylase — barley malt diastase (produced by the Olaynensky

plant) at a rate of 20 mg / h (2.5 every 15 minutes) were injected into the duodenum, then 2 hours - hydrolysin, 1 h - amylase and another 2 h - hydrolysin. The collected juice was determined by the content of bicarbonate (back titration), protein (according to Lowry), amylase (according to Smith-Rowe in the modification of A.M. Ugolev), lipase (according to Titsu) and total proteolytic activity (according to Kunitz). The volume of urine was taken into account, the amount of amylase was determined every hour in the urine and blood plasma. The introduction of acidified hydrolysin into the duodenum resulted in sufficiently stable secretion in hourly dogs from an hour to an hour, with a high content of enzymes in the juice, slightly decreasing in volume by 6–8 hours of experience. Intraduodenal administration of malt diastase did not change the amount of secretion and excretion of bicarbonates, lipase protein and proteases in the juice. A decrease in the secretion volume and the release of bicarbonates due to this was noted at the end of the experiment, apparently because of its duration. In all experiments, intraduodenal administration of diastase caused a significant decrease in amylase secretion (in some experiments, up to 20-30% of the initial level). When first introduced, its content in juice decreased to  $46.7 \pm 13.0\%$ , with the second to  $41.6 \pm 11.1\%$ . Moreover, in the majority of experiments, the inhibitory aftereffect was observed for only 1 hour during the first administration of diastase. The diastase preparation had a slight amylolytic activity: there were only 110 units in 1 ml of the solution administered to the intestine. amylase, which is 100-400 times less than in the pancreatic juice of dogs in our experiments (10-40 thousand units / ml).

**Results and discussion:** Therefore, even a small increase in the amylolytic activity of the duodenal contents, caused by a heterogeneous (plant) enzyme, always leads to inhibition of secretion by the pancreas, namely amylase. This allows us to make a conclusion about the differentiation of inhibition of pancreatic secretion, depending on the type, of enzymatic activity increased in the duodenum. Hence the possibility of differentiated correction of pancreatic enzyme secretion by:

a) oral administration of enzyme preparations with different activity of their ingredients or preparations with the same activity (according to the results of our study - the activity of amylolytic);

b) inhibition of pancreatic amylase secretion.

The question of the mechanism of such inhibition is complex. Inhibition of cholecystinin-pancreozymin release from endocrine 1-duodenal cells is thought to be caused by intraduodenal administration of trypsinogen by inhibiting pancreatic secretion. The question of how and what the effect is determined by us requires further study. The process of implementing the effect in the pancreas itself is also unclear, since inhibition may be caused by several factors, including a decrease in the synthesis of amylase by pancreatic cells. Taking into account a significant reduction in excretion of amylase, a significant decrease in synthesis can be allowed, which should cause a decrease in amylase increment. However, the amylolytic activity of the

blood during the experiment did not undergo significant changes, and the renal secretion of amylase did not decrease, but on the contrary, increased.

The urine amylase excretion increased during the experiment due to an increase in diuresis and amylolytic activity of the urine, gradually reaching colossal values (50-70 times more than in the first 2 hours of the experiment). This exogenous amylase could not be absorbed from the intestine, since for 2 infusions only 2,200 amylases were injected into the intestines, and more than 10,000 units were excreted in the urine in 6 hours, not to mention the fact that amylase in the intestines is very insignificant. It can be assumed that, under conditions of increased amylolytic activity of the duodenal contents, there is a redistribution of the exothermally secreted and incrementally enzyme. However, a comparison of the amount of amylase underexpressed with juice (327232 units) as a result of the inhibitory effect of diastase on secretion and excreted in the urine (10303 units) showed that the renal route releases about 3% of the amount of amylase by which its secretion was reduced by gland. Therefore, it is unlikely that a gradual increase in renal excretion of amylase in the course of the experiment is the result of the introduction of malt diastase into the food. In addition, based on current knowledge about the secretion of pancreatic enzymes, it is difficult to assume the existence of mechanisms regulating the redistribution of intracellular transport of one of the hydrolytic enzymes.

**Conclusion:** Most likely, the increase in urinary amylase excretion is not associated with the effect of the introduced diastase, but is the result of a gradual increase in the permeability of the histohematogenous barrier and a slightly increased deviation of amylase from the gland into the blood under conditions of stimulation of the gland with hydrolysin.

The very effect of inhibition of amylase excretion under the action of malt diastase introduced into the duodenum is realized at the level of moderate selective inhibition of the synthesis and extrusion of amylase by the pancreas.

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**MORPHOLOGICAL CHANGES OF THE LYMPHIC SYSTEM OF THE  
WALL OF THE SMALL INTESTINE AFTER DIFFERENT METHODS OF  
THE STOMACH**

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**Introduction:** In the extensive literature on the evaluation of the effectiveness of surgical interventions (1,3,4,6), information about the functional state of the resected stomach (2, 5, 6) is insufficiently compared with other organs of the abdominal cavity. However, judging the nature of changes in the abdominal organs after various interventions requires the study of not only functional, but also morphological rearrangements, in particular of the lymphatic system of the gastrointestinal tract.

**Objective:** To assess changes in the abdominal organs after various interventions and morphological changes, in particular the lymphatic system of the gastrointestinal tract.

**Material and methods:** For this purpose, the effects of various methods of gastric resection on the morphology of the gastric lymphorus according to Billroth-1, Kuprianov-Zakharov, Billroth-N, modified by Hofmeister-Finsterer and Polia-Reyhya 10 dogs are included in the control group. Intraorganic lymphatic vessels of the intestine were detected after the operation by the method of injection of the mass of Gerot, followed by the preparation of enlightened drugs from different layers of the intestinal section. These studies were performed before and at different times after resection of the stomach.

**Results and discussion:** The study of drugs showed that after resection there is a further development of the process of restructuring all parts of the lymphatic bed. This is characterized by an increase in the diameter of capillaries and blood vessels, as well as their anastomoses. The presence of lateral outgrowths and extensions on the capillaries, as well as on the vessels that anastomose among themselves, indicates