

THE IMPORTANCE OF GASTRIN IN THE DIGESTION PROCESS

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Abstract:

Gastrin is a hormone produced by the G cells of the stomach, pancreas, and duodenum. Participates in the regulation of digestion. Gastrin production is activated by reducing the acidity of the stomach, stretching the walls of the stomach, and eating a lot of protein foods. Gastrin affects the parietal cells of the gastric mucosa, which are responsible for the production of hydrochloric acid. It also affects the movement of bile, pancreatic secretion and gastrointestinal tract. Normally, when food is consumed, there should be an increase in the production of hydrochloric acid and a decrease in its level after digestion. Increased levels of hydrochloric acid decrease gastrin production through a feedback mechanism.

Keywords: gastrin, Zollinger-Ellison syndrome, Addison-Birmer syndrome, vitamin B12. Relevance of the topic.

Introduction

Overview of the study

Gastrin (Greek gaster - "stomach") is a hormone involved in the regulation of digestion. It is produced by G-cells belonging to the diffuse endocrine system of the gastrointestinal tract located in the mucosa of the stomach, duodenum and pancreas. Gastrin exists in three forms in the human body. Conditions for the production of gastrin are to reduce stomach acidity, eat protein foods, and stretch the stomach walls. G cells are also responsible for the activity of the vagus nerve. The action of gastrin is aimed at the parietal cells of the gastric mucosa, which produce hydrochloric acid. In addition, it affects the production of bile, pancreatic secretion and gastrointestinal motility, the growth of epithelial and endocrine cells. It is normal to increase the production of hydrochloric acid when eating food and decrease its level after digestion is complete. By a feedback mechanism, increasing the level of hydrochloric acid reduces the production of gastrin.

Forms of gastrin

Gastrin exists in three main forms, which are distinguished by the number of its components (amino acids): gastrin 34 (G-34 (large)), gastrin 17 (G-17 (small)) and gastrin 14 (G-14 (mini)).



There are other types of gastrin - 71, 52 and 6. They circulate in the blood in sulfated and non-sulfated forms. The main circulating forms are gastrin-17 (G17) and gastrin-34 (consisting of 17 and 34 amino acids, respectively).

Gastrin-34 (or the prohormone form called progastrin, which circulates in the blood and is converted to active gastrin I in target cells) is produced by the pancreas. And the other two varieties are mainly produced in the stomach.

In the gastric mucosa of the antrum, 90% of gastrin is formed in the form of G-17, and G-34 is mainly formed in the small intestine. It is the main hormone that regulates the production of HCl is G-17.

The physiological stimulator of gastrin secretion is food, as well as reflex factors - expansion of the stomach after a meal, the effect of nervous stimuli, the effect of chemicals - Ca and adrenaline. Gastrin stimulates gastric secretion, it increases the secretion of hydrochloric acid by parietal cells, which is one of its main functions. When the concentration of hydrochloric acid in the stomach increases (up to pH 3), the release of gastrin slows down. A decrease in gastrin secretion increases the acidity of gastric juice.

Research relevance

- Diagnosis of Zollinger-Ellison syndrome (gastrinoma).
- Monitoring the stage of Zollinger-Ellison syndrome and the effectiveness of its treatment.
- Diagnosis of Addison-Birmer syndrome (pernicious anemia).
- Monitor the stage of Addison-Birmer syndrome and the effectiveness of its treatment.
- Determining the cause of vitamin B12 deficiency.
- Assessment of the state of the digestive system.
- For differential diagnosis of hyperparathyroidism and Zollinger-Ellison syndrome.

The purpose of the study.

- Identify symptoms of Zollinger-Ellison syndrome (ulcers of the gastrointestinal tract resistant to conventional treatment, persistent steatorrhea or diarrhea).
- Diagnosis of Zollinger-Ellison syndrome.
- Identify conditions that increase the risk of Zollinger-Ellison syndrome (Wermer syndrome).
- Early detection of Addison-Birmer syndrome clinic.
- Diagnosis of Addison-Birmer syndrome.
- Identify symptoms of vitamin B12 deficiency (anemia, epithelial regeneration disorders, intestinal, neurological diseases).

Determination of gastrin in Zollinger-Ellison syndrome.

Determination of gastrin levels in the blood plays an important role in the diagnosis of Zollinger-Ellison tumors. Zollinger-Ellison syndrome develops with increased production of gastrin. The reason for this is gastrinoma - in most cases it is caused by malignant tumors, and the secretion is not inhibited by an increase in stomach acidity. The tumor can be located inside the gastrointestinal tract (pancreas, duodenum, stomach) or outside it (omentum, ovaries). The



clinical presentation of Zollinger-Ellison syndrome includes gastrointestinal ulcers and bowel dysfunction (diarrhea) that are resistant to conventional therapy. Gastrinoma often occurs in Wermer syndrome (MEN-1), an inherited disorder in which tumor changes affect the parathyroid glands, pituitary gland, and pancreas.

In addition, gastrin secretion increases significantly in pernicious anemia - Addison-Biermer's disease - when the synthesis of the internal Castle factor, which is responsible for the absorption of vitamin B12, is disturbed and when the parietal cells of the stomach wall are destroyed. In addition to the castle factor, these cells release hydrochloric acid. The clinical presentation of the disease is determined by atrophic gastritis and vitamin B12 deficiency (anemia, epithelial regeneration disorders, intestinal diseases, neurological symptoms).

Increased gastrin levels.

Hypergastrinemia, as well as in cases of disturbed acid secretion in the stomach, when the hormone level is sufficiently increased, for example, pernicious anemia, chronic atrophic gastritis, stomach cancer, as well as pyloric stenosis, vagotomy without gastric resection, in some patients with simple gastric ulcer. Since the level of gastrin mainly depends on food intake, the study should be carried out strictly on an empty stomach. Many medications for wound healing increase gastrin levels, particularly H₂ antagonists, antacids, and H⁺ pump blockers (omeprazole). It is acceptable to study the level of gastrin before starting or ending drug treatment. Gastrin levels can be increased by drinking coffee and smoking.

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