Peptic Ulcer Treatment

Ulcer disease is a chronic disease characterized by recurrent relapses over many years. The incidence of duodenal ulcer is 4-5 times higher compared to gastric ulcer. The etiology of the disease is not yet recognized.


Chronic antral gastric ulcer

Current prevention or treatment is possible as

- Inhibition of factors leading to irritation and erosion of the mucosa.
- Support of protective endogenous factors.

Factors influencing the formation of peptic ulcer

- **Aggressive** – HCl, pepsin, NSA, alcohol, smoking, coffee, spicy food, infection *Helicobacter pylori infection.*
- **Protective** – mucus, prostaglandins, HCO_3 secretion, food.

Inhibition of factors leading to irritation and erosion of mucous membranes.

1. It is mainly protection against **hydrochloric acid**.
2. **Food** plays an important role in increasing HCl production but also binding it. Of the basic foods, HCl meat stimulates gastric secretion the most, but it also has a strong binding ability. Therefore, it is recommended in small portions. Meals must be regular.
3. Some habits can be harmful. It is mainly smoking (induces vasoconstriction in the stomach wall and reduces the effect of protective mechanisms), strong alcohol and coffee, which must be rejected (1 beer, a glass of wine per day is allowed, but no distillate).
4. **Substances with erosive effects** on the GIT mucosa should be avoided . These are mainly salicylates and a group of non-steroidal anti-inflammatory drugs.
5. The presence of ***Helicobacter pylori*** correlates with the onset and recurrence of duodenal ulcer. It occurs in 95% of patients with duodenal ulcer, most often in the antrum of the stomach, where it is also the cause of antral gastritis. Its eradication brings relief to the sick. The role of H. pylori is not clearly understood, as this microorganism also occurs in asymptomatic humans (60 %). However, eradication of *H. pylori* in patients with peptic ulcer disease leads to a reduction in disease recurrence.
6. **Pharmacotherapy**.

Substances neutralizing gastric pH - antacids

Locally acting, non-absorbable

They neutralize HCl in the stomach and inactivate pepsin. Magnesium and aluminum compounds are used. Magnesium-containing antacids have a laxative effect, aluminum compounds are rather constipating, so they are often combined.

- ***algeldrate*** (aluminum hydroxide in hydrated active form), ***simaldrate*** (magnesium aluminum silicate), ***hydrotalcite*** (basic magnesium aluminum carbonate), ***magnesium aluminate***, ***aluminium phosphate***.

Advantages: they are very cheap, *disadvantages:* they leave the stomach contents very quickly, therefore they only lead to a temporary reduction in stomach acidity, they act briefly (1,5–2 hours).

Total antacids

- ***sodium bicarbonate*** and ***and calcium carbonate***

They are used, for example, for heartburn. It cannot be used for a long time because: it could lead to systemic alkalosis, it is absorbed, CO_2 is released upon reaction with HCl , which can lead to secondary mucosal irritation and hypersecretion of HCl.

Compounds acting as antagonists at the receptor level

Stimulation leading to HCl secretion is provided by 3 types of receptors:

- muscarinic,
- histamine H_2 and
- gastrin.

Only the first two types can be damped.

Parasympatholytics

Drugs with stronger affinity for gastric receptors are used (M_1). It is used ***pirenzepine***. Its effects are equal to H_2 lytics, recurrences are less frequent.

H_2 antagonists

- ***famotidine*** and ***ranitidine***

Histamine H_2 receptor antagonists, unlike their predecessor *cimetidine,* do not have antiandrogenic effects. Famotidine is more effective than ranitidine.

- ***cimetidine***

It is the first drug in this group to enter clinical use. Cimetidine has been shown endoscopically to lead to the healing of 85% of duodenal ulcers within 8 weeks of treatment, compared with 30% of those treated with placebo. The shortest time needed for healing is around 4 weeks, while the pain disappears within a few days. Healing of gastric ulcers reaches 75-80%. A more complication of treatment is more frequent recurrence of the ulcer (in 5-30%), then a long-term maintenance evening dose is chosen to suppress HCl secretion at night on an empty stomach. Smoking reduces the effects of cimetidine.

The main side effect of cimetidine is its antiandrogenic effect and subsequent gynecomastia.

Omeprazole

Proton pump inhibitors

More detailed information can be found on the page |Proton pump inhibitors

- ***omeprazole*** (eg HELICID®)

Irreversible H^+/K^+ ATPase inhibitor - proton pumps. The pump exchanges K^+, which travel into cells, for H^+, which are secreted into the gastric lumen. Cl^- forms HCl. Omeprazole is a lipophilic weakly basic substance that, after absorption, reaches the parietal cell via the bloodstream. Because the binding is irreversible, the enzymatic activity is restored only with the newly formed enzyme, ie after 18 hours. Omeprazole is *the most effective inhibitor of HCl secretion.* 70% of duodenal ulcers heal within 14 days, 95-100% within 4 weeks. Gastric healing is slower (depending on size and location), but practically all of them heal within 8 weeks. Doses of 20-40 mg daily are used for treatment. Omeprazole is also effective in H_2 lytic resistant ulcers , severe reflux oesophagitis and Zollinger-Ellison syndrome. Omeprazole also appears to reduce the incidence of *H. pylori*. Tolerance of omeprazole is very good, there are no serious drug interactions during treatment. A newer related substance with similar effects is ***pantoprazole***.

Promoting protective factors

They support the production of mucin, form a protective layer of mucus, stimulate the production of prostaglandins E2, which induce local vasodilation, improve mucosal nutrition and accelerate its healing.

Substances which inhibit to eliminate H.pylori

- ***colloidal Bi***

Complex salt of citric acid. In an acidic gastric environment, it precipitates with proteins released by the erosive action of HCl in the ulcer area. The stable complexes thus formed adhere to the base of the ulcer and form a protective layer. It also prevents the activation of pepsinogen, inactivates the finished pepsin chemically. *Bismuth salts have a direct toxic effect on H. pylori strains*.

Agents acting as "local dressing"

- ***sucralfate***

They form a protective layer of mucus, have a special affinity for the base of the ulcer, which they cover and protect against the effects of HCl. It binds bile acids and pepsin, stimulates the production of endogenous prostaglandins, and increases mucus production. Co-administration of antacids is not recommended. Ulcer healing follows after 4 weeks of treatment in 80%, after 6 weeks in 90%. Relapse is less common. Side effects: 2.2% constipation (most common), less common: dry mouth, dyspepsia.

Synthetic prostaglandin analogs (E_1)

- ***misoprostol***

They reduce HCl secretion and have a cytoprotective effect. The main use is in preventive administration in patients treated with non-steroidal anti-inflammatory drugs.

References

Related articles

- Gastroduodenal ulcer disease

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