

Pain in the upper abdomen

Pain in the upper abdomen is a common problem. They are usually mild and disappear spontaneously. However, they can also be an expression of a serious disease or at least a disease that requires targeted treatment. A medical professional must be consulted if the pain is particularly severe or if it does not subside after a long time. This is especially true if the ailments increase with time.

They can be caused by quite different diseases: Apart from trivial causes, there may be a mechanical disorder of the gastrointestinal tract (reflux disease, gastric emptying disorder), an inflammation (gall bladder, pancreas), or also a heart disease (angina pectoris). Symptoms that manifest themselves in the form of repeated burning feeling in the upper abdomen, fullness after eating, flatulence, in rare cases as nausea and vomiting, are referred to as dyspeptic complaints that are possibly caused by an infection with the *Helicobacter pylori* bacterium.

Helicobacter pylori

H. pylori is a small, rod-shaped bacterium that only occurs in humans, exclusively on and within the stomach lining. The acidic stomach environment (pH=1) prevents the growth of other bacteria; however, it favours *H. pylori*, which produces a protein (urease) that can convert urea into ammonium and carbon dioxide.

H. pylori is transmitted directly from person to person, usually as early as during childhood, in particular, from one person to another within a family. The colonisation is usually symptom-free and persists for decades or throughout the entire lifecycle. It can be detected in approximately one-half of humanity, more frequently in developing countries and migrant populations rather than in developed countries.

The chronic infection may trigger lesions in the gastric mucosa, which manifest themselves in the form of dyspeptic complaints.

H. pylori is an infectious agent that has lived in and among humans for a very long time. It could already be detected in the glacier mummy Ötzi. To a certain extent and based on their extensive common evolution, humans and bacteria have adapted to each other.

As a result, *H. pylori* is not only a pathogen for humans, however, at the same time, it protects them from certain diseases, for example, from the backflow of gastric juice into the esophagus (reflux) or from oesophageal cancer. Therefore, the mere detection of *H. pylori* is not a sufficient reason to undergo treatment.

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This only becomes necessary if the negative consequences of the colonisation settlement outweigh the positive consequences.

In which situations does treatment for *H. pylori* become essential?

Clear reasons for treatment include:

- **An ulcer of the duodenum or stomach.**
A duodenal ulcer is predominantly caused by *H. pylori*. Other causes of gastric ulceration possibly include, e.g., the ingestion of an anti-rheumatic painkiller.
- The so-called **MALT lymphoma** of the stomach is a direct consequence of the stomach mucosa inflammation caused by *H. pylori*.
- The risk of **stomach cancer** is slightly increased in carriers of *H. pylori*. In particular, carriers of *H. pylori* who have direct relatives suffering from stomach cancer should be treated.

On the other hand, opinions are divided as to whether treatment should also be performed if dyspeptic symptoms are present, but no alterations of the gastric mucosa are detected in the gastroscopy. The answer to the question of whether treatment is appropriate is therefore complex and must be taken by a competent medical specialist together with the patient, based on the examination results.

Diagnostic

Different test methods are available for the detection of *H. pylori*: Gastroscopy, antigen stool test, and the Helicobacter breath test. All these tests are very sensitive and are able to detect an infection in over 90% of the cases, however, they are applied for different purposes.

A gastroscopy (stomach endoscopy) is performed in a gastroenterology practice or in a hospital. A thin, flexible tube is inserted into the stomach via the mouth or nose. This makes any alterations of the gastric mucosa visible, and it is possible to take samples (biopsies) that can be tested for **urease** immediately by way of a **rapid test**, as well as in a laboratory for additional examinations (tissue and culture). These options are usually combined to increase the reliability of detection. Additionally, culture can also be applied to test the sensitivity of the bacteria to antibiotics.

Antigen detection in the stool is a simple, rapid, and inexpensive examination method. It is mostly applied to verify, 4-6 weeks after the treatment, whether all bacteria were destroyed.

The **Helicobacter breath test** (13C breath test) detects the presence of the urease enzyme. After drinking a test solution, carbon-13 is only exhaled if active urease (exclusively produced by *H. pylori*) is present in the stomach. For the test to be meaningful, cer-

tain medications (antibiotics, acid inhibitors) must not be ingested 2-4 weeks prior to the examination. A 4-hour food abstinence must additionally be observed prior to the examination. 30 minutes after drinking the test solution, breath samples are dispensed into special collection containers and examined in a laboratory. This test is also applied to verify the success of treatment.

Treatment

Treatment consists of the ingestion of a combination of two to three antibiotics and an acid-inhibiting drug for a period of 1 to 2 weeks.

A follow-up on the degree of effectiveness is necessary after the treatment. This can be performed without carrying out a new gastroscopy by means of an antigen stool test or Helicobacter breath test. The success rate of the treatment is 90%. If *H. pylori* remain detectable, the treatment must be repeated by applying a different combination.

During the past ten years, Helicobacter pylori strains have increasingly been detected that have become resistant to certain antibiotics. Resistance testing in the laboratory enables the selection of the most active antibiotics and increases the treatment success rate.

Re-infection may occur following successful treatment, however, this occurs extremely rarely.