

# Helicobacter heilmannii associated gastritis: case report

Jelena Vukojević, Ivan Nikolić, Biljana Kukić, Bogdan Bogdanović, Zoran Nikin

## SUMMARY

*Helicobacter heilmannii* (*Gastrospirillum hominis*) is a small, gram-negative bacterium from *Helicobacter* family. Its incidence is significantly lower than for *Helicobacter pylori* and it accounts for about 1% of cases, mainly in countries with lower socioeconomic conditions. *Helicobacter heilmannii* may be a causative agent for gastritis, gastric ulcer but it can also trigger malignant diseases such as gastric adenocarcinoma and gastric mucosa-associated lymphoid tissue lymphoma. This paper presents our first case of gastritis caused by *Helicobacter heilmannii*.

**Key words:** *Helicobacter Heilmannii*; Gastritis; Case Reports

## INTRODUCTION

Chronic gastritis is caused by many factors among which bacteria from genus *Helicobacter* are predominant. A widely spread *Helicobacter pylori* (Figure 1) is the leading bacterium associated with gastritis; in developed countries it accounts for 20% to 50% of gastric patients while in developing countries the percent is up to 80 (1). Other bacteria from the same genus such as *Helicobacter bizzozeronii*, *Helicobacter felis* (2), and *Helicobacter heilmannii* may also be a causative agent of gastritis. In case of *Helicobacter heilmannii*, the incidence is significantly lower, about 1% of all *Helicobacter* infections among humans (3) but the infection frequency is still higher in countries with poor socioeconomic status. The presence of *Helicobacter heilmannii* and *Helicobacter pylori* in stomach can trigger not only a chronic gastric inflammation but also gastric ulcer and neoplasms such as gastric adenocarcinoma or gastric mucosa-associated lymphoid tissue (MALT) lymphoma (4), which has been shown in animal model experiments (5, 6). The association of *Helicobacter heilmannii* infection with gastric adenocarcinoma has been supported by the findings of increased values of biomarkers in gastrointestinal precancerous and cancerous diseases (i.e. ulcer and gastric cancer) caused by these bacteria (7).

patient was found normal except for epigastric distress. The results of blood and biochemical tests were within normal ranges. Having in mind anamnestic data and physical examination findings, the patient was referred to the upper gastrointestinal endoscopy. Endoscopy finding showed hyperemic spots in antral and angular mucosa of the stomach. The greater curvature of the stomach was presented with cerebriform folds extending to stomach bottom. The atypical areas of gastric mucosa were biopsied for histopathological examination. Microscopic findings of biopsied material showed edema of lamina propria with thick inflammatory infiltrate of lymphocytes, plasma cells, and neutrophil granulocytes protruding into epithelium of foveolas. The test results did not show the presence of *Helicobacter pylori* but the finding of *Helicobacter heilmannii* was positive (Figure 2). According to literature data, eradication therapy in bacteria positive patients proved to be efficient. Therefore, the patient was treated with two antibiotics and one proton pump inhibitor during one week, which significantly improved her general condition. Control endoscopic examination was not indicated but the patient was referred to regular checkups.

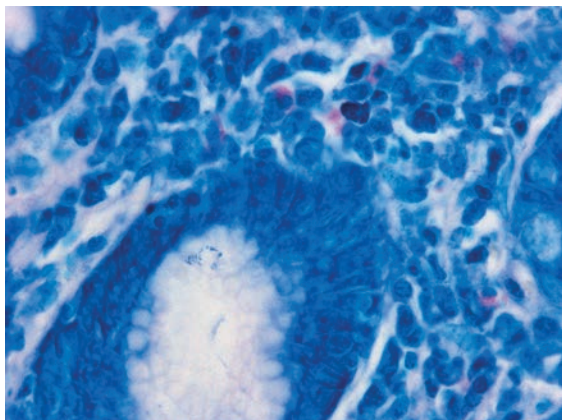


Figure 1. Modified Giemsa stained *Helicobacter pylori*, at 630x magnification

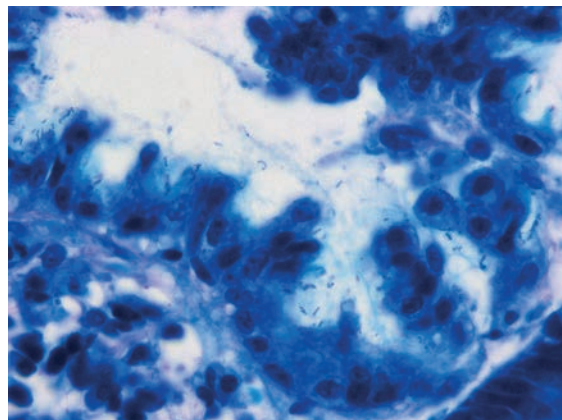


Figure 2. Modified Giemsa stained *Helicobacter heilmannii* at 630x magnification

## CASE REPORT

A 50-years-old woman visited the doctor and complained of dyspeptic problems manifested as nausea, vomiting, abdominal pain, and loss of appetite. When taking family anamnesis, a non-Hodgkin lymphoma was confirmed in case of her mother. Physical examination of the

## DISCUSSION

Denta et al. (8) was the first who described *Helicobacter heilmannii*, previously referred to as *Gastrospirillum hominis*, in 1987. The name *Helicobacter heilmannii* was proposed in honor of the German pathologist Konrad Heilmann (9). It is a small, gram-negative bacterium, measuring

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Oncology Institute of Vojvodina,  
Sremska Kamenica, Serbia  
Correspondence to:  
Dr. Jelena Vukojević,  
Oncology Institute of Vojvodina,  
Institutski put 4,  
21204 Sremska Kamenica, Serbia  
[vukojevic.jelena@gmail.com](mailto:vukojevic.jelena@gmail.com)

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from 3.5 to 7.5  $\mu\text{m}$  and 0.9  $\mu\text{m}$  in diameter and it has 3 to 8 coils, which makes it two times larger than *Helicobacter pylori*. After many attempts, the bacterium was finally classified into the Helicobacter family by means of polymerase chain reaction (PCR) and fluorescence in situ hybridization (FISH) methods (10, 11). Based on 16S rDNA sequence *Helicobacter heilmannii* was divided in subtype 1 and subtype 2 (12, 13). Later, *Helicobacter heilmannii* was divided into four subtypes based on 16S rDNA and FISH method. The most frequently isolated type in humans is subtype 1 (78.5%); subtype 2 has been found in 8%, subtype 3 in 1%, and subtype 4 in 10% of reported cases (5). Urease gene sequences *ureA* and *ureB* are more specific than 16S rRNA gene sequence and thus more useful as a method in phylogenetic analysis of Helicobacter species found in stomach (14).

It is easy to discriminate morphologically *Helicobacter heilmannii* from other gastric bacteria, including *Helicobacter pylori*. Spiral bacteria such as *Helicobacter felis*, *Helicobacter salomonis*, and *Helicobacter bizzozeronii* are similar to *Helicobacter heilmannii* and it is difficult to differentiate one from another under the light microscope. To make this distinction we need 16S rDNA gene sequencing or FISH method (15). Both *Helicobacter heilmannii* and *H. pylori* possess urease enzyme and produce positive Campylobacter-like organism (CLO) but they do not differ serologically. They are naturally found in the gastric mucosa of domestic animals such as dogs, cats, and pigs and because animal-to-human transmission is quite often, they are classified into zoonoses. Some studies report the correlation between the socioeconomic conditions and higher incidence of the infection (16).

Clinical picture of the disease may vary from asymptomatic to typical dyspeptic discomforts and diagnosis is exclusively made based on histopathological findings. Over the time, the histopathological course of an inflammatory disease may turn from the stage of atrophy, metaplasia, and dysplasia into malignancy. Helicobacter infection usually causes gastric inflammation but it may also be a trigger for development of malignancy. Malignant forms are mainly caused by *Helicobacter pylori* and rarely by *Helicobacter heilmannii* (4). MALT lymphoma associated with *Helicobacter heilmannii* has been reported as more frequent. It can be explained by the lymphocyte predominant inflammatory infiltrate. The studies of Goteri et al. Holcke et al. and Stolte et al. (17-19) point to *Helicobacter heilmannii* as more frequent trigger in the germinative centers of lymph nodes than in case of *Helicobacter pylori*. A concomitant infection with *Helicobacter heilmannii* and *Helicobacter pylori* is rare and it might indicate that *Helicobacter heilmannii* infection actually protects one from getting *Helicobacter pylori* but this phenomenon has not been proved yet (9). Treatment of *Helicobacter heilmannii* is similar to that of *Helicobacter pylori*. The therapy with two antibiotics and one proton pump inhibitor during one week achieves satisfactory results (20).

*Helicobacter heilmannii* belongs to Helicobacter family but the strain has not been completely investigated so far. Helicobacter infection in domestic and some wild animals is characterized by one common pathogenetic mechanism: induction of Th1 chronic inflammatory response of the host against infection (21).

The manifestation and treatment of *Helicobacter heilmannii* and *Helicobacter pylori* infections are similar. The only difference between the two bacteria is in their histopathological findings, which are used

for establishing the accurate diagnosis. Prevention implies improvement of socioeconomic conditions and avoidance of contacts with infected animals. *Helicobacter heilmannii* infection should always be considered as a possibility in patients with dyspepsia and especially those who are in contacts with pets or other animals.

#### Conflict of interest

We declare no conflicts of interest.

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