Clinical Significance of *Helicobacter heilmannii* Colonizing Human Gastric Antrum

by Anup Hazra, Carlos Ricart and Janusz J. Godyn

*Helicobacter heilmannii* is a gram-negative elongated spiral bacillus, well known for infecting domestic animals like cats, pigs and dogs but rarely transmitted to humans. A case is reported, with *H. heilmannii* identified in the antrum of a 70-year-old female while she was evaluated for *Helicobacter pylori* infection. A review of *H. heilmannii* infection is presented and it is emphasized that the existence of the *H. non-pylori* species should be remembered when gastric biopsies are examined. Correct information is helpful to the clinicians for complete eradication of the microorganisms from the gastric mucosa.

Anup Hazra, M.D., Carlos Ricart, M.D., Janusz J. Godyn, M.D., Department of Pathology and Laboratory Medicine, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, New Brunswick, New Jersey.

**REPORT OF A CASE**

A 70-year-old previously healthy lady was admitted to the emergency department with a week long history of right extremity swelling and life threatening anemia. A
subsegmental pulmonary embolus was identified. Three units of packed red blood cells were given. A search for the cause of the blood loss was initiated.

She did not have any significant prior medical or surgical history. Esophagogastroduodenoscopy and colonoscopy were performed to rule out gastrointestinal bleeding. Upper endoscopy revealed a moderately large hiatal hernia; gastric fundus was normal, whereas body, antrum and pylorus showed frequent patchy small erosions. The duodenal bulb also showed small erosions. The colonoscopy was essentially normal. Following the pathologic diagnosis rendered on the biopsies, she was treated appropriately.

PATHOLOGIC FINDINGS

Microscopically, the biopsies of gastric antrum showed mild chronic active inflammation (Figure 1). Microorganisms with characteristic morphology of *H. heilmannii* were identified on Giemsa stain (Figure 2). *H. pylori* microorganisms were absent. Since *H. heilmannii* cross-react with *H. pylori* microorganisms, it was not surprising that immunohistochemistry analysis showed positivity for antigens of *H. pylori* (Figure 3-top).

Usual *H. pylori* positivity for antigens of *H. pylori* (Figure 3-bottom). No *H. heilmannii*-specific antibody was available for immunohistochemical analysis or serum studies. Serum anti-*H. pylori* IgG was high (2.12, with normal range 0.00–0.90 I.S.R), and serum anti-*H. pylori* IgM was negative, with negative index value less than 0.8.

COMMENT

The genus *Helicobacter* was classified in 1989 and so far approximately three dozen of the species have been identified. The prototype *H. pylori* is the most well known for causing approximately 5% of gastrointestinal ailments in the community. *H. heilmannii*, however, is responsible for only 1% of all human *Helicobacter* infections (3). *H. heilmannii* microorganisms are slender spiral gram-negative bacilli, measuring up to 1.0 micrometer wide and 5.0 to 10.0 micrometers long as opposed to smaller, curved, and less spiral *H. pylori*. They are about twice the size of *H. pylori*

Whereas the routine transmission of *H. pylori* appears to be human-human, *H. heilmannii* is transmitted by domestic animals like pigs, cats, and dogs (1). Consequently, the incidence of *H. heilmannii* is significantly higher in low socioeconomic conditions, in environment with less hygiene and in rural areas where physical exposure to animals is higher than urban areas.
Unlike *H. pylori*, *H. heilmannii* is generally uncul-tivable and the diagnosis of infection is reliant on his-tology. Some reports in the published literature have described the screening of *H. heilmannii*-like organ-isms directly from gastric biopsies by PCR based assays (4). The immunoperoxidase stain shows anti-genic epitopes cross-reacting between *H. heilmannii* and *H. pylori* (5). Most species possess strong ure-olytic ability, particularly those associated with gastric mucosa (4), this is the basis of identifying the organ-isms by rapid urease test. When a positive rapid urease test is seen associated with a negative culture, negative histology and negative Gram stain for *H. pylori* in a patient with chronic active gastritis, a positive morphologic identification of *H. heilmannii* is important to establish treatment modality (6). Morphologic identifi-cation of *H. heilmannii* is particularly important in children, who acquire the disease as a zoonosis more frequently than adults. Persistence of *H. heilmannii* has been recorded in children after successful eradica-

Interests in *Helicobacter pylori* have increased significantly after the discovery of its association with duodenal and gastric ulcers, gastric adenocarcinoma and primary mucosa associated lymphoid tissue (MALT) lymphoma. As *H. heilmannii* is potentially equally responsible for those infection-related compli-cations, morphologic identification of these bacilli is of utmost importance in *H. pylori* negative patients.

References

Figure 3. (Top) *H. heilmannii* on the surface of gastric mucosa. Immunoperoxidase stain for *H. pylori* antigen, crossreaction. High power. (Bottom) *H. pylori* microorgan-isms on the surface of gastric mucosa. Immunoperoxidase stain for *H. pylori* antigen. High power.