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Original Article

Association of *Helicobacter pylori* and *Helicobacter heilmannii* - Special Case Reports and Literature Review

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ABSTRACT

The prevalence of *Helicobacter pylori* induced gastritis is common than other species of *Helicobacter*. We hereby reporting two rare gastritis cases caused by in association of *H. pylori* and *H. heilmannii* for the first time in Cambodia. The patients were treated with 14 days therapy of clarithromycin, metronidazole and esomeprazole for complete eradication of two *Helicobacters*.

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1. Introduction

Helicobacter pylori, a stomach-colonizing bacterium that causes gastritis, peptic ulcer disease and is a risk factor for gastric adenocarcinoma [1], and malignant mucosa-associated lymphoid tissue lymphoma [2]. *H. pylori* is one of the most common causes of chronic infection in humans and have a worldwide distribution. In developing countries, *H. pylori* infection occurs at younger ages, frequently during infancy, and reaches a prevalence of 70% to 90% in some regions [3]. *Helicobacter heilmannii* previously known as *Gastrospirillum hominis* is a helical bacterium that resembles to *Spirochetes*, able to infect humans to a much lesser extent than *H. pylori*. *Helicobacter heilmannii* was first described in 1987 as a corkscrew-shaped gram negative urease producing tightly coiled bacillus in the human gastric mucosa [4], and the proposed name "*Gastrospirillum hominis*" [5]. Unlike *H. pylori*, "*H. heilmannii*" is not restricted to humans, since it can naturally infects a broad range of animals such as cats, dogs, pigs and primates leading to mild to moderate gastritis [6, 7]. The frequency of human *H. heilmannii* infection is less than 1% of the population in industrialized countries [8], and 3% to 8% in developing countries [9]. We hereby reporting two cases of *H. pylori* and *H. heilmannii* associated gastritis, which might be the first such cases in Cambodia.

2. Case Reports

In February 2011, a 25 years old Cambodian woman presented to out-patient department in Sen Sok International University Hospital with ongoing symptoms of vomiting, epigastric pain, dyspepsia and heartburn for several weeks. The patient was completely examined including; HEENT, cardiac, respiratory, neurological, urinary, musculoskeletal, psychological, endocrine, allergy and GI problems. She had free of symptoms except the above mentioned GI-complaints. The other history such as, food, smoking and alcoholic habits, and animal contacts were also collected. She does not have any habits except eating raw vegetables and close contact with her pet dogs. The fasting gastric fluid aspiration (suction) was done by naso-gastric tube (NGT) and blood sample was also collected for laboratory investigation. The laboratory test results revealed that the physical appearance of gastric fluid was slight reddish in color and the pH was measured at 6.5. Microscopic findings proved two kinds of motile spiral organisms with significant increase of leukocytes and red blood cells were observed from fresh gastric fluid (Figure 1). Based on the morphology, size and direct gram stain the spiral organisms were confirmed as *Helicobacter pylori* and *Helicobacter heilmannii* (Figure 2). The rapid urease test and anti-*H. pylori* IgG were also showed positive. There is no significant change was observed in complete blood count. The patient was successfully treated with triple therapy; clarithromycin, metronidazole and esomeprazole for 14 days. The patient was monitored after treatment and found the disappearance of ongoing symptoms and the absence of two spiral organisms were observed from gastric fluid by microscopic examination.

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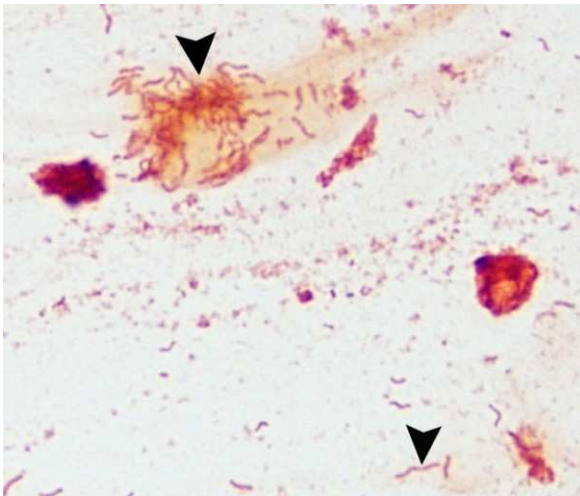
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Figure 1. *H. heilmannii* (top arrowhead) and *H. pylori* (bottom arrowhead) in gastric fluid direct wet mount, 40 X magnification.



Figure 2. Gram stain image of *H. pylori* in clusters (top arrowhead) and *H. heilmannii* (bottom arrowhead) from gastric fluid, 100X magnification.



The second patient was a 56 year-old Cambodian woman presented to out-patient department in our Hospital on March 2011, with ongoing symptoms of distension, regurgitation, reflux, vomiting, nausea and burning sensation in the upper part of abdominal region for long time. The patient was completely examined including; GI problems, cardiac, respiratory, neurological, musculoskeletal, urinary, psychological, endocrine, HEENT and allergy problems. The abdomen was soft with active bowel sound and no hepatosplenomegaly was observed. Other than clinical symptom the patient's food, smoking, alcoholic and animal contact habits were completely gathered. She has a habit of close contacting with her pet dog and cat, and eating raw, under cooked meat products and vegetables. The gastric fluid and blood were collected for Laboratory investigation. The results revealed that the gastric fluid appeared as slight reddish color with 7.1 pH. There are two motile spiral bacteria with significant increase of red blood cells and leukocytes were observed by direct microscopic

examination of gastric fluid. The gram stained smears confirmed two spiral organisms; *Helicobacter pylori* and *Helicobacter heilmannii*. The anti-*H. pylori* IgG serology and rapid urease test were also showed positive. The complete blood count level appears within the normal range. The patient was administered with clarithromycin, metronidazole and esomeprazole for 14 days. The symptom-free and eradication of spiral organisms were achieved after two weeks therapy.

3. Discussion

Although it is well-established that *Helicobacter pylori* is the most important cause for the development of gastritis and peptic ulcer in all age groups. *H. pylori* is considered as a healthcare issue because of the mortality associated with the infection, due to the risk of ulcer bleeding and gastric cancer. The pattern and distribution of *H. pylori* gastritis correlate strongly with the risk of clinical sequelae namely, duodenal or gastric ulcers, mucosal atrophy, gastric carcinoma, or gastric lymphoma [10]. *H. heilmannii*, a motile, urease producing gram-negative spiral bacterium can cause chronic active gastritis [11]. It was observed in Thai individuals that 65.7% of cases positive with *H. pylori* and 6.2% of cases were found to be *G. hominis* in 247 total subjects. In *G. hominis* infection, 43.6% of cases had normal gastric mucosa. Superficial, erosive and atrophic gastritis cases were 13.2, 10.9 and 12.5%, respectively [12]. Recent analysis indicated that *Helicobacter heilmannii* gastritis transmission to humans by contact with animals [13]. We present our experience that, the accurate diagnosis of *Helicobacter pylori* and *H. heilmannii* is achieved by immediate analysis of fasting gastric fluid (mucosa) by microscopic examination to find out their motility from fresh fluid and to identify the morphology by direct gram stain. The currently available rapid urease test can only enhance the diagnosis of *Helicobacter pylori* but it could not confirm other *Helicobacter species*. The rapid urease test has a possibility to misdiagnose urease positive *Proteus spp*, which can also cause wound infection in the stomach. Anti-*H. pylori*- IgG by ELISA could provide high sensitivity but cannot distinguish present or past infection. Investigation of fasting gastric fluid pH may be a useful indicator for gastritis. The earlier studies confirmed that the four diagnostic tests such as rapid urease test (RUT), direct gram stain (DGS), histology and IgG- ELISA were found to be good sensitivities, specificities as well as accuracies when used in combination for the detection of *H. pylori* [14]. We successfully treated both *Helicobacter pylori* and *H. heilmannii* with 14 days triple therapy; clarithromycin, metronidazole and esomeprazole for complete eradication.

In summary, our case reports suggest that the *Helicobacter pylori* and *H. heilmannii* induced gastritis can be diagnosed from fasting gastric fluid. The accurate diagnosis can be achieved by immediate analysis of gastric fluid by direct microscopic examination. For the treatment of patients with gastritis, 14 days therapy of clarithromycin, metronidazole and esomeprazole offers best results for complete eradication of *Helicobacter pylori* and *H. heilmannii*. Avoiding close contact with pets can protect infection by *H. heilmannii*. Hence the physicians are advised to try our experience for the diagnosis and management of patients with *H. pylori* and *H. heilmannii* gastritis in routine clinical practice.

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