Topography of chronic active gastritis in *Helicobacter pylori*-positive Asian populations: age-, gender-, and endoscopic diagnosis-matched study

TAKESHI MATSUHISA¹, NORIO MATSUURA², and NOBUTAKA YAMADA³

¹Department of Gastrointestinal Endoscopy, Tama-Nagayama Hospital, Nippon Medical School, 1-7-1 Nagayama, Tama, Tokyo 206-8512, Japan
²Surgery for Organ Function and Biological Regulation, Nippon Medical School, Tokyo, Japan
³Second Department of Pathology, Nippon Medical School, Tokyo, Japan

Introduction

Half the world’s population is infected with *Helicobacter pylori*, and long-term infection with *H. pylori* has been shown to evolve into superficial gastritis, atrophic gastritis, and intestinal metaplasia.¹ *H. pylori* infection is also closely associated with the development of gastric cancer.² The prevalence of *H. pylori* infection varies among races³ and between countries.⁴, ⁵ The incidence and mortality of gastric cancer is high among Japanese and Chinese populations but extremely low in Thai and low in Vietnamese populations.⁶ We have reported a comparative study of *H. pylori* infection, mucosal atrophy, and intestinal metaplasia in Asian populations, and results showed Japanese subjects with *H. pylori* infection showed more severe atrophic and metaplastic gastritis than Thai and Vietnamese.³ Uemura et al. reported *H. pylori* infection is associated with the development of both intestinal-type and diffuse-type gastric cancer and that among infected Japanese patients, those with severe atrophy accompanying intestinal metaplasia, corpus-predominant gastritis, or both are at particularly high risk.⁵ The aim of this study is to investigate the degree of corpus-predominant gastritis in *H. pylori*-positive Chinese (Beijing and Fuzhou), Thai, and Vietnamese patients compared to Japanese (Tokyo) patients.

Materials and methods

Patients

From November 1994 to March 2000, examinations were performed on patients consecutively recruited with present or past abdominal complaints. Endoscopic examinations were performed by us, and histological findings of biopsy specimens were diagnosed by one pathologist (N.Y.). Results of these examinations were
prospectively analyzed. Informed consent was obtained before examination, and patients who needed medication were treated by local doctors according to our endoscopic diagnosis.

Of the 236 cases examined in Beijing, 105 *H. pylori*-positive patients were matched to 105 *H. pylori*-positive Japanese patients among 1994 Japanese patients. Age, gender, and endoscopic diagnosis were matched between Japanese and other Asian populations. At that time, patients were categorized into 5-year age groups. Endoscope diagnosis was classified into peptic ulcer, gastric cancer, gastric polyp, erosive gastritis, atrophic gastritis, and normal study. Of the 199 Chinese cases in Fuzhou, Fujian Province, on the west side of Taiwan, 85 *H. pylori*-positive patients were matched to 85 *H. pylori*-positive Japanese patients, as were 195 *H. pylori*-positive patients of 435 cases in Thailand and 154 *H. pylori*-positive patients of 497 cases in Vietnam. None of these patients was previously treated for *H. pylori* infection.

We began this comparative study in 1994, visited China, Thailand, and Vietnam a total of 18 times, and performed approximately 1600 endoscopic examinations. These examinations were all performed by the same Japanese endoscopists and one Japanese pathologist using the same criteria as we always use in Japan.5,7,8

This study was performed with the approval of the China-Japan Friendship Hospital Beijing, Peoples' Republic of China, the First Hospital, Fujian Medical University, Fuzhou, Peoples' Republic of China, Chiang Mai University, Chiang Mai, Kingdom of Thailand, and the Trung Vuong Emergency Center, Ho Chi Minh, Vietnam, and with the permission of the ethics committees of the Nippon Medical School, Tokyo, Japan.

**Diagnosis of *H. pylori* infection**

We used hematoxylin and eosin stain, improved toluidine blue stain, and *H. pylori*-specific antibody immune stain (Dako, Glostrup, Denmark) in selected cases for the histological diagnosis of *H. pylori* infection. Biopsy specimens were sampled from the greater curvature of the lower antrum (antrum), the greater curvature of the upper corpus (corpus), and the lesser curvature of the lower corpus (angulus).5,7,8

**H. pylori score**

The *H. pylori* scores from the specimens obtained from the antrum and from the corpus were classified into four grades (0, none; 1, mild; 2, moderate; 3, severe) using the Updated Sydney system.9 Grades 1 to 3 were considered *H. pylori*-positive.

**Neutrophil activity score**

The neutrophil activity score of the specimens obtained from the corpus and from the antrum was used to determine the ratio of corpus gastritis to antrum gastritis (C/A ratio). We used the criteria of the Updated Sydney system9 for the diagnosis of neutrophil activity score, which was classified into four grades (0, none; 1, mild; 2, moderate; 3, severe).

**Statistical analyses**

The Wilcoxon signed-rank test was used to compare differences in neutrophil activity and *H. pylori* score and C/A ratio by PC (Stat View Version 4.54; Abacus Concepts, Berkeley, CA, USA). For the purposes of this study, *P* values less than 0.05 were considered statistically significant.

**Results**

Table 1 shows *H. pylori*-positive adult subjects matched by age, gender, and endoscopic diagnosis between each pair of populations: Chinese (Beijing) and Japanese (Tokyo), Chinese (Fuzhou) and Japanese (Tokyo), Thai (Chiang Mai) and Japanese (Tokyo), and Vietnamese (Ho Chi Minh) and Japanese (Tokyo).

**H. pylori score**

The *H. pylori* score of the antrum was significantly higher in the Chinese (Fuzhou), Thai, and Vietnamese groups than in the Japanese group (*P* < 0.001, *P* < 0.01, and *P* < 0.01, respectively). Conversely, the corpus *H. pylori* score in the Chinese (Beijing) group was significantly lower than in the Japanese group (*P* < 0.001) (Table 2).

**Neutrophil activity score**

The neutrophil activity score of the antrum was significantly higher in the *H. pylori*-positive Chinese (Fuzhou) (*P* < 0.001), Thai (*P* < 0.05), and Vietnamese (*P* < 0.01) patients than in the *H. pylori*-positive Japanese patients. The neutrophil activity score of the corpus was significantly lower in the *H. pylori*-positive Chinese (Beijing) (*P* < 0.05), Thai (*P* < 0.01), and Vietnamese (*P* < 0.05) than in the *H. pylori*-positive Japanese patients (Table 2).

**Ratio of corpus gastritis to antrum gastritis**

The C/A ratio of the Japanese patient increased with age and exceeded 1.00 (corpus-dominant gastritis) in