Int. J. Cancer: **117,** 1058–1059 (2005)

SHORT REPORT

Helicobacter pylori infection is associated with colon adenomatous polyps detected by high-resolution colonoscopy

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***Helicobacter pylori* (*H. pylori*) is associated with the development of cancer in the stomach, but both positive and negative associations were reported with colorectal neoplasia. We sought to determine whether *H. pylori* is associated with colon neoplasia in Japanese population. We examined 332 patients who underwent routine high-resolution total colonoscopy and serologic testing for IgG antibodies agonist *H. pylori*. Subjects who received cyclooxygenase-2 inhibitors or previous eradication therapy and those with borderline titer levels were excluded from data analysis ($n = 27$). Seronegative control subjects were from the same study population to maximize the representativeness. There were no significant differences in age and gender between the 2 patient groups. A significant increase in the incidence of adenomatous polyps ($p < 0.0001$) and decrease in normal colonoscopic findings ($p < 0.0005$) were observed in seropositive patients than those seronegative. Our study indicates an etiological link of *H. pylori* infection to colorectal neoplasia and the need of routine colonoscopy in seropositive patients.**

Key words: *helicobacter pylori*; colon polyp; high-resolution colonoscopy

Helicobacter pylori (*H. pylori*) infects 50% of the world population. Its prevalence varies widely in different parts of the world with average rates of 40–50% in western countries, rising to >90% in the developing world.[1] Compelling evidence from epidemiological, histopathological and animal studies has linked *H. pylori* infection to the subsequent development of gastric cancer.[2] Nevertheless, the data available currently regarding a possible link between *H. pylori* seropositivity and colorectal cancer risk are limited and inconclusive. Presence of *H. pylori* is associated with excessive and prolonged release of gastrin, which has been suggested to have a role in the development of gastric cancer and, potentially, colorectal cancer.[3]

We examined *H. pylori* infection and colonic pathology data from 334 patients who underwent colonoscopy at our clinics to determine whether this infection is associated with colon neoplasia. Patients were pretreated with polyethylene glycol-electrolyte solution and received intravenous administration of scopolamine butylbromide and diazepam just before the endoscopic examination. We used high-resolution colonoscopy of nonmagnifying or magnifying type (CF-Q240ZI, Olympus Optical Co., Tokyo, Japan). When pathologic lesions were suspected, 0.2% indigo carmine dye was sprayed onto the areas. *H. pylori* infection was diagnosed with serologic testing for IgG antibodies against *H. pylori*. Subjects who received cyclooxygenase-2 inhibitors or previous eradication therapy and those with borderline titer levels were excluded from data analysis ($n = 27$).

The overall prevalence of *H. pylori* in our study population was the same or slightly lower than that reported recently in Japan.[4] There were no significant differences in age and gender between the 2 patient groups. However, the prevalence of seropositivity was significantly lower in subjects with normal colonoscopic findings ($p < 0.0005$) and higher in those with adenomas ($p < 0.0001$) (Table I).

Previous studies reported positive[5,6] and negative[3,7,8] association between *H. pylori* infection and colorectal neoplasia. Control group selection has a strong impact on the results of a case-control study. We selected the control subjects from the same study population that produced the cases to eliminate socioeconomic and other potential background differences and to maximize the representativeness of the controls. As a result of the improvements in image resolution and maneuverability of colonoscopy, we were able to observe the surface detail of the colorectal mucosa in all patients. Magnifying colonoscopy was particularly useful to discriminate neoplastic from non-neoplastic lesions,[9,10] but conventional colonoscopy was carried out when patients preferred it. We observed highly significant differences in adenomatous, but not hyperplastic, polyps in patients with seropositivity (Table I). Importantly, hyperplastic polyps are considered to be non-neoplastic. Most colorectal cancers arise from precursor adenomatous polyps, in concurrence with the adenoma carcinoma sequence.[11]

Our studies have several limitations. We could not show direct association between *H. pylori* and colorectal cancer. The number of such patients is small because the present study was carried out as routine colorectal cancer screening. We used IgG ELISA to detect *H. pylori* infection. Serological testing is non-invasive and offers better sensitivity than histology, but it might be misleading in elderly patients with mucosal atrophy who may develop seroconversion.[12] Even if false negative results may occur, however, the rate of *H. pylori* infection might have been underestimated in patients with adenomas. Although not significant, the difference in the infection rate between males and females might also have an influence on the results.

H. pylori strains that possess cag A, vac A and babA2 genes worsen gastric mucosal inflammation significantly and may be more virulent than others.[1,12] Our studies do not address whether colon adenomas are also related to such virulent strains and positive[13] and negative[14] results were reported on cag A seropositivity and colorectal cancer risk. Host factors such as interleukin-1β or environmental factors such as salt intake are suggested to be important for gastric carcinogenesis.[1] The host response induces epithelial cell proliferation through hypergastrinemia, which is reportedly associated with mitogenic effects on colorectal muco-

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Received 23 February 2005; Accepted after revision 8 April 2005
DOI 10.1002/ijc.21280
Published online 28 June 2005 in Wiley InterScience (www.interscience.wiley.com).

TABLE I – PRESENCE OR ABSENCE OF *HELICOBACTER PYLORI* AND COLONOSCOPIC FINDINGS[1]

	Helicobacter positive	*Helicobacter* negative	
Age (years)	58.5 ± 1.18	62.7 ± 1.07	
Gender (no.)			
Male	128	48	
Female	84	47	
Endoscopic diagnosis (no.)	210	95	
Normal	67 (31.9%)	52 (54.7%)	$p < 0.0005$
Hyperplastic polyp	26 (12.3%)	18 (18.9%)	
Tubular adenoma	89 (42.4%)	18 (18.9%)	$p < 0.0001$
Tubulovillous adenoma	2 (1%)	0 (0%)	
Villous adenoma	2 (1%)	0 (0%)	
Cancer	24 (11.4%)	7 (7.4%)	

[1]Numbers in parentheses are percentages. Plus/minus values are means ± SEM. Analysis of variance followed by Bonferroni *t*-test were used to assess the differences among groups. $p < 0.05$ was considered to be statistically significant.

sae and with an increased risk of colonic malignancy in a subpopulation of patients.[6,15] The way in which *H. pylori* interact with such host and environmental factors in the lumen of the large bowel to produce neoplasia remains unknown.

Eradication therapy is not recommended for all *H. pylori*-infected patients. In the U.S. and Japan, the consensus for therapy is for patients with an established peptic ulcer disease. Elimination of *H. pylori* apparently increases the risk of developing gastroesophageal reflux diseases (GERD) and esophageal adenocarcinoma.[1] Our present study of higher incidence of colon adenoma in seropositive subjects suggests that these people should also be eradicated to prevent colon cancer. More studies including prospective, long-term examination of large groups of patients are needed to evaluate exactly the clinical outcomes in the colon of *H. pylori* and its eradication, as well as to examine the biological basis of *H. pylori*-associated neoplasia in the gastrointestinal tract.

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