Serological testing is a useful noninvasive method for the diagnosis of *Helicobacter pylori* infection. It is easy for patients to accept the test because of its noninvasiveness, and the results can be quickly obtained. Furthermore, this assay is a global test that evaluates the entire stomach. Therefore, potential sampling errors can be avoided.1

Many serological kits for *H. pylori* detection are commercially available in clinical practice. The sensitivity of enzyme-linked immunosorbent assay (ELISA)-based serological tests ranges between 90% and 97%, and the specificity ranges between 50% and 96%.2-4 The sensitivity and specificity of serological tests mainly depend on the nature of the antigenic materials used. In addition to the antigens used, the presence of atrophic gastritis is also one of the important factors that influence the test’s accuracy.

In the July 2010 issue of the *Journal of the Chinese Medical Association*, Hung et al5 reported that a quantitative ELISA test (HEL-pTEST II; AMRAD, Kew, VIC, Australia) had a decreased specificity for the detection of *H. pylori* in patients with atrophic gastritis (86.7% vs. 91.9% in patients with and without atrophic gastritis, respectively). However, this test was highly sensitive for the detection of *H. pylori* infection in patients with atrophic gastritis (100.0% vs. 96.5% in patients with and without atrophic gastritis, respectively). Hung et al therefore concluded that a quantitative ELISA test is suitable for the diagnosis of *H. pylori* infection in patients with atrophic gastritis because of its excellent sensitivity.

In patients with atrophic gastritis, all invasive and noninvasive tests for the diagnosis of *H. pylori* infection have their restrictions because the bacterial load of *H. pylori* decreases gradually during the progression of gastric atrophy, and bacteria are unevenly distributed in the stomach. In cases with extensive intestinal metaplasia, *H. pylori* can disappear completely.5 If *H. pylori* infection is patchy or if the number of bacteria is low, invasive diagnostic tests based on gastric biopsies can yield inaccurate results because of sampling errors.

Recently, Yoo et al7 confirmed that invasive *H. pylori* tests, especially the CLO test, have a low detection rate for *H. pylori* in the presence of mucosal atrophy and intestinal metaplasia. Kokkola et al8 also demonstrated that urease tests and histology have decreased sensitivity for detection of *H. pylori* in patients with atrophic gastritis. Furthermore, Korstanje et al9 showed that the noninvasive 13C-urea breath test has decreased accuracy for diagnosis of *H. pylori* infection in patients with atrophic gastritis.

Shin et al,10 who recently evaluated the validity of biopsy-based tests (histology, culture, and urease test) and serological tests for detection of *H. pylori* infection, also reported a decreased specificity of serological tests for the diagnosis of *H. pylori* infection in patients with atrophic gastritis. When their analysis was limited to patients without atrophic gastritis or intestinal metaplasia, all tests, except for culture, showed sensitivity and specificity > 90%. However, the sensitivity of the CLO test markedly decreased with the progression of atrophic gastritis and intestinal metaplasia, and the serological test was markedly less specific in the presence of atrophic gastritis (specificity, 40.7% vs. 83.7% in patients with and without atrophic gastritis, respectively). The authors suggested that a combination of at least 2 tests is necessary for the detection of *H. pylori* in the clinical settings of atrophic gastritis or intestinal metaplasia.

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**EDITORIAL**

Application of Serology in the Diagnosis of *Helicobacter pylori* Infection in Patients With Atrophic Gastritis

Ping-I Hsu*

Division of Gastroenterology, Department of Internal Medicine, Kaohsiung Veterans General Hospital, Kaohsiung, and National Yang-Ming University School of Medicine, Taipei, Taiwan, R.O.C.

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*Correspondence to: Dr Ping-I Hsu, Division of Gastroenterology, Department of Internal Medicine, Kaohsiung Veterans General Hospital, 386, Ta Chung 1st Road, Kaohsiung 813, Taiwan, R.O.C. E-mail: pihsu@vghks.gov.tw • Received: June 30, 2010 • Accepted: August 24, 2010
Hung et al\(^5\) reported that the results of ELISA were indeterminate in 12.4\% (21/170) of their patients. They excluded these cases in the final analysis, but such high uncertainty will influence the application of serological tests as diagnostic or screening tools. A “gray zone” result is a significant limitation of serological tests. \textit{H. pylori} infection induces mucosal inflammation in the stomach. Infected patients have shown a wide variety of systemic antibody responses, thereby leading to several indeterminate results in serological tests.\(^1\) In cases with indeterminate results, other tests should be performed to determine the status of \textit{H. pylori} infection.

In addition, the accuracy of serological tests might vary between different races and geographic regions, possibly due to different antigenic properties of local bacterial strains and antibodies of commercial kits used for the diagnosis of \textit{H. pylori} infection. The usefulness of a serological assay should be assessed in a local setting.

In conclusion, the sensitivity of biopsy-based tests for the diagnosis of \textit{H. pylori} infection decreases with the progression of atrophic gastritis. Quantitative ELISA is a noninvasive and sensitive test for detection of \textit{H. pylori} infection in subjects with atrophic gastritis, but this test is less specific in the presence of atrophic gastritis. A combination of at least 2 tests (e.g. serology plus urea breath test) is necessary in clinical practice to diagnose \textit{H. pylori} infection accurately in patients with atrophic gastritis or intestinal metaplasia. If discordant results of the tests exist, another sensitive test (e.g. histology) can be performed to determine the status of \textit{H. pylori}.

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