LETTER to the EDITOR

Better ROC Curves for a Regionally Developed Helicobacter Pylori Antibody Test

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Helicobacter pylori (HP) has been recognized as a risk factor for gastric cancer and seroepidemiological studies have been playing an important role in establishing the association in terms of estimating relative risk. We have previously reported an anti-HP IgG antibody test established in the United States (High-Molecular Weight Campylobacter-Associated-Protein: HM-CAP; Enteric Products Inc., Westbury, NY)(Evans et al., 1989) to show substantially decreased sensitivity in Japanese (Matsuo et al, 2000). We suggested that undifferentiated misclassification due to the lower sensitivity might cause underestimation of relative risks for gastric cancer (Kleinbaum et al, 1982) and proposed that development of the regionally developed IgG test was essential (Matsuo et al, 2000).

We report here the results of a comparison between newly developed Japan-based [E-plate 'Eiken' H. pylori antibody: E-plate; Eiken Inc., Tokyo] and commonly accepted US-based (HM-CAP) HP IgG antibody tests. The E-plate was generated with Japanese oriented strains of HP (Kikuchi and Miwa, 2000). The subjects were 283 participants (138 males and 145 females) in an HP eradication intervention study, aged 39-69 yr and without a history of gastrectomy, who underwent gastroscopy at Aichi Cancer Center Hospital in 1999 (Hamajima et al., 2001). Blood samples stored at –80℃ were used for the two antibody tests at the same time in the laboratory of SRL Co (Tokyo). Tissue culture was conducted immediately after biopsy as previously described (Matsuo et al., 2000). Both blood and tissue samples were available for 252 out of 283 participants. The Elisa values of HM-CAP measured in this study almost completely correlated with those measured on enrolment to the eradication study (correlation = 0.968). The tissue culture was adopted as a gold standard for this study. The ROC curves for each test are shown as Figure 1. Although the difference between the curves was not statistically significant (p=0.14), it illustrates better sensitivity and specificity for the Japan-based test. When the value of 14 mg/dl that gave the highest correct classification rate was defined as the cut-off value for the E-plate, the sensitivity was 95.2% and the specificity was 76.2%. On the other hand, those for HM-CAP were 85.1% and 77.4%, respectively (commercially

accepted cut-off value >=2.3 was applied).
Though the improvement was not statistically significant, our results support the earlier conclusion that a regionally developed test may be preferable for epidemiologic studies on Helicobacter Pylori (Yuan et al, 1999).
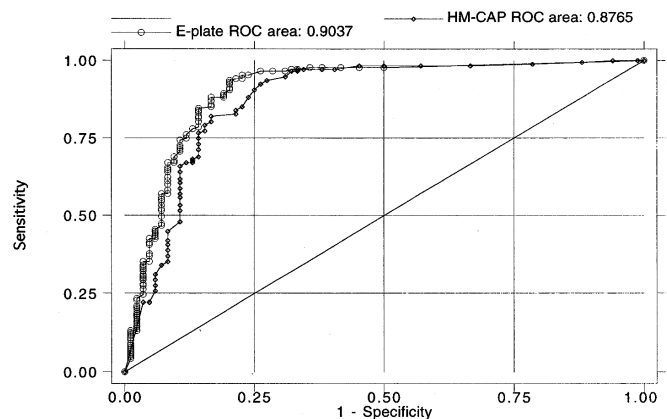

Figure 1. ROC Curves for HP IgG Antibody Tests. The line with small circles indicates the E-plate curve, and that with small squares that for HM-CAP. Areas under the ROC curves were 0.904 and 0.877 for the E-plate and the HM-CAP, respectively.

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References

Evans DJ Jr, Evans DG, Graham DY, et al (1989). A sensitive and specific serologic test for detection of Campylobacter pylori infection. *Gastroenterology,* **96**, 1004-8.

Hamajima N, Matsuo K, Saito T, et al (2001). Interleukin 1 polymorphisms, lifestyle factors, and Helicobacter pylori infection. *Jpn J Cancer Res,* **92***,* 383-9.

Kikuchi S, Miwa H (2000). Efficiency of the ELISA test "E-plate 'Eiken' H. pylori antibody" for the diagnosis of Helicobatcter pylori infection (in Japanese). *Igaku to Yakugaku*, **43**, 581-6.

Kleinbaum DG, Kupper LL, Morgenstern H (1982). Epidemiologic Research:principles and quantitative methods. *New York:Van Nostrand Reinhold*, 220-40.

Matsuo K, Hamajima N, Tominaga S, et al (2000). Helicobacter pylori IgG antibody test established in the United States showed a substantially lower sensitivity for Japanese population. *Am J Gastroenterol*, **95**, 1597-8.

Yuan JM, Yu MC, Xu WW, et al (1999). Helicobacter pylori infection and risk of gastric cancer in Shanghai, China: Updated results based upon a locally developed and validated assay and further follow-up of the cohort. *Cancer Epidemiol Biomarkers Prev*, **8**, 621-4.