Prevalence of Helicobacter pylori in Bangladesh: Rapid urease test
Lee CS, Kim D, Jung CW, Park JY

Abstract
H. pylori infection is common in developing countries which show very high prevalence. We studied the prevalence of H. pylori in Bangladesh subjects with dyspepsia. H. pylori was looked for in biopsy specimens taken from the antrum by rapid urease test (Campylobacter-like organism (CLO) test). Two hundred forty one subjects with dyspepsia were studied. Overall 168 (69.7%) of the subjects studied were CLO positive. H. pylori was found in 63.9% of patients with gastritis, 77.8% of patients with duodenitis, 80.7% of patients with gastric ulcer, 85.2% of patients with duodenal ulcer, 14.3% of patients with GERD (gastroesophageal reflux disease), 66.7% of patients with gastric polyp and 62.5% of normal control subjects. No significant age specific increase in the prevalence of H. pylori infection was noted in the age groups. No significant difference was observed in relation to sex (male: female = 68.4%: 70.1%, P>0.1). However, subjects with duodenal ulcer disease had significantly increased prevalence of H. pylori compared with normal controls (P=0.01). Subjects with GERD had significantly decreased when compared to normal controls (P=0.02).

Key words
H. pylori, Rapid urease test (CLO test), Duodenal ulcer, GERD

Introduction
H. pylori is one of the most important pathogens for a wide spectrum of gastroduodenal diseases including acute and chronic active gastritis, peptic ulcer diseases, gastric mucosa associated lymphoid tissue lymphoma and gastric malignancy 1-7. It may be acquired at any age but once acquired, the infection persists for years and often for a lifetime. H. pylori prevalence varies according to ethnic groups significantly 1. H. pylori can be identified in gastric mucosal samples by histologic examination, culture and detection of urease activity. A urea breath test using 13C or 14C also has been developed for identifying H. pylori on the basis of urease production with release of labeled CO2 4-6. Antibodies (IgG and IgA) to H. pylori have been identified in sera of individuals with H. pylori colonization 2,3. H. pylori produces large amounts of urease. The rapid urease test of gastric biopsy material is a relatively simple and reliable method for presumptive identification of H. pylori. A positive test result from an increase in pH, with the phenol red indicator turning from light orange to red. The test is inexpensive, with a sensitivity of at least 90 percent and a specificity approaching 100 percent 8,9. Until now, some studies have tried to show the prevalence of H. pylori infection by serological methods and urea breath test in Bangladesh. But there has not been yet any study to do endoscopic biopsies to determine H. pylori infection in this country. So we carried out a prospective study to determine for the first time, the incidence of H. pylori infection in Bangladesh by rapid urease test in endoscopic biopsies.
Materials and methods
This was a prospective study on the patients with gastrointestinal symptoms in Bangladesh, performed in the Department of Internal Medicine of Bangladesh Korea Friendship Hospital during the period from August, 2001 to May, 2003. Two hundred forty one subjects were included for this study as shown in table 1. Most of the patients came to check endoscopy because of dyspepsia. One or two mucosal biopsies were taken from the gastric antrum of each patient using a disinfected endoscope. These biopsy tissues were used for CLO test. After endoscopic examination, 201 (83.4%) of 241 were found to have definite disease as shown in table 2 and 40(16.6%) were found to have normal endoscopic examination, which were regarded as controls. Gastritis was considered present when there was erythema and erosion of the gastric mucosa. Duodenitis was considered present when there was definite erythema and erosion of the duodenal mucosa.

CLO test
During the gastrointestinal endoscopy, one or two biopsy specimens were taken from the gastric antrum at the lesser curvature. The antral biopsy specimen was immediately inserted in CLO test(Ballard Medical Products, Utah 84020 U.S.A.) which detects the urease enzyme of H. pylori. Results were read for up to 24h for a CLO test. Positive results in urease tests were read according to the manufacturer's instructions.

Statistical Methods
This data was examined by Chi-square test (including Fisher's exact test where appropriate). We considered a P value of 0.05 or less to indicate statistical significance.

Results
A total of 241 subjects with upper gastric symptoms were included for this study. Main symptoms were epigastric pain (preprandial or postprandial), upper abdominal dyscomfors, nausea, indigestion etc. One hundred forty- four (144) were male and ninety seven (97) were female. The average age of these subjects was 35.6 years (range 15 to 69).

Table- 1 shows H. pylori prevalence and age group of subjects attending endoscopy. Overall 168(69.7%) of the subjects studied were CLO positive. About 64% of the subjects were found to be infected by the age of 20 but no significant age specific increase in the prevalence of H. pylori infection was noted in the age groups(Figure). No significant difference was observed in relation to sex (male:female=68.4%: 70.1 %, P>0.1 ).

Table-1. Age & sex related H. pylori prevalence by
CLO test

Table-2 shows the H. pylori prevalence according to endoscopic diagnosis. Our classification of endoscopic diagnosis was gastritis, duodenitis, gastric ulcer, duodenal ulcer, GERD, gastric polyp and normal, which was considered as a control. However among subjects with duodenal ulcer disease the prevalence of H. pylori was significantly increased when compared with normal control (P=0.01 ). Subjects with GERD was likely to have significantly decreased H. pylori when compared to normal control (P=0.02). No significant difference was observed in relation to sex in each disease.
Table-2. Endoscopic Diagnosis related H. pylori prevalence by CLO test Endoscopic* Diagnosis

<table>
<thead>
<tr>
<th>Endoscopic* Diagnosis</th>
<th>CLO* Male No. (%)</th>
<th>CLO* Female No. (%)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>97 (62.63%)</td>
<td>49 (30.55%)</td>
<td>0.57</td>
</tr>
<tr>
<td>Duodenum</td>
<td>9 (4.71%)</td>
<td>5 (3.26%)</td>
<td></td>
</tr>
<tr>
<td>Gastric Ulcer</td>
<td>31 (22.60%)</td>
<td>24 (15.61%)</td>
<td>0.48</td>
</tr>
<tr>
<td>Duodenum Ulcer</td>
<td>54 (35.76%)</td>
<td>12 (7.71%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Normal</td>
<td>40 (27.24%)</td>
<td>10 (7.05%)</td>
<td>0.21</td>
</tr>
<tr>
<td>GERD</td>
<td>7 (4.69%)</td>
<td>4 (0.00%)</td>
<td>0.38</td>
</tr>
<tr>
<td>Gastric Poly</td>
<td>3 (1.6869%)</td>
<td>1 (0.0000%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>241 (168.69%)</td>
<td>144 (101.70%)</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Discussion

There are several methods to detect H. pylori infection. Among them, we used rapid urease test to detect H. pylori infection in the stomach. It is a very simple and reliable method for a quick diagnosis of H. pylori infection in the endoscopy unit. Early diagnosis of H. pylori infection enables the physician to initiate therapy before histological results are available. The rapid urease tests with high sensitivity and specificity are commonly used in adults and children. We studied the prevalence of H. pylori by CLO test for the first time in Bangladesh.

Our results showed that no significant age specific increase in the prevalence of H. pylori infection was noted in the each age group. And no significant difference was observed in relation to sex in each disease. These results show that H. pylori may be a main cause for important gastrointestinal disease in Bangladesh. Clinically, we experienced, if we eradicate the H. pylori in peptic ulcer patients, most patients were improved in their symptoms.

Ahmad et al. reported that the prevalence of H. pylori in Bangladesh subjects was 92% in their serological study. And Miah et al. reported that the prevalence of H. pylori in diabetes patients was 84.8% in their serological study. Mahalanabis et al. also reported that the prevalence of H. pylori is 63% in infant aged 1-3 months, 33% in 0-15 months old children, 84% in 6-9 year olds. Two of them were studied serologically, another one was by 13C-urea breath test.

Our results show low percentage when compared to former several studies. In this regard, we think that there is a time interval more than 6 years between our study and former studies. Another reason is the different method of study. In addition we took only one or two biopsy tissue from gastric antrum during endoscopy, so we think that this is also a contributing factor to the low prevalence of our results.

This study showed the correlation between gastric disease by endoscopic diagnosis and H. pylori infection for the first time in Bangladesh. Especially, we showed that H. pylori infection is significantly increased in the duodenal ulcer patients, so we can recognize H. pylori as a main cause for duodenal ulcer disease. This study also showed that GERD has significantly low incidence of H. pylori infection. This results support the assumption that H. pylori may protect the gastroesophageal reflux. However, the data of the current study may not be an exact estimate of the prevalence of H pylori in Bangladesh because the sample we studied was small. Association of H pylori infection with dyspepsia and rapid urease test in Bangladesh needs further large scale study.
Original Article

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References