Prevalence of Helicobacter pylori Infection in Patients with Peptic Disease

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Background: *Helicobacter pylori is one of the most common human infections worldwide. It has been established as etiology of chronic gastritis and peptic ulcer disease, gastric adenocarcinoma and mucosal associated lymphoid tissue lymphoma (MALT). During this decade, there have been some reports showing a decline in global prevalence of H.pylori infection and peptic diseases including in many Asian countries.*

Objective: *To study the H. pylori infection in patients with peptic diseases, association with other factors and comparison to previous data.*

Material and Method: *Retrospective observational study of endoscopic reports for upper gastrointestinal tract diseases in patients with peptic diseases from October 2009 to September 2010 at the Endoscopic Unit, Department of Medicine, Rajavithi Hospital. Patients were examined for the presence of H. pylori infection by rapid urease test (RUT) or histology staining.*

Results: *Five hundred and seventy patients with a mean age of 55.0 ± 16.02 years with peptic diseases were studies. Endoscopic findings showed 106 GU patients (18.6%), 29 DU patients (5.1%), 3 combined GU and DU patients (0.5%) and 432 NUD patients (75.8%). The prevalence of H. pylori infection were 64% (365 of 570 patients). Prevalence of H. pylori infection were 61.3% of NUD cases, 68.9% of GU cases, 82.8% in DU cases and 100% in combined GU and DU cases. Comparison with previous data (Anantapunpong S. Rajavithi Med J 1999; 10: 17-26), the prevalence of H. pylori infection overall and in DU are not changed but in NUD and GU are increased.*

Conclusion: *The prevalence of H. pylori infection is still high in peptic diseases. The patients with age more than 50 years have more GU, less NUD than the younger groups. In comparison with a previous study, the prevalence of H. pylori infection in overall and in DU are not changed but in NUD and GU are increased.*

Keywords: *Prevalence, Helicobacter pylori, H.pylori, Peptic diseases*

J Med Assoc Thai 2012; 95 (Suppl. 3): S22-S27
Full text. e-Journal: *http://www.jmat.mat.or.th*

Helicobacter pylori is one of the most common human infections worldwide. It is a gram-negative spiral-shaped bacterium which has many different clinical outcomes. It has been established as a major etiological agent of chronic gastritis, duodenal ulcer (DU), gastric ulcer (GU)[1], gastric adenocarcinoma and mucosal associated lymphoid tissue lymphoma (MALT)[2,3]. It has been found in 73-100% of patients with duodenal ulcer (DU) and 65-100% of those with gastric ulcer (GU)[4-9]. In developing countries, the prevalence of *H. pylori* infection was found in more than 70% of the populations[10,11]. Conversely, it was found in only 27.6% to 32.5% in developed countries[12,13]. During this decade, there have been some reports showing a decline in global prevalence of *H. pylori* infection and peptic diseases[14-16]. This phenomenon also was seen in many Asian countries[17-20]. The present study aimed to determine the prevalence of *H. pylori* infection, their association with other factors and comparison to previous data[21,22].

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Material and Method

Study population

The protocol for this research was reviewed by the institutional ethics committee of Rajavithi Hospital. This was a retrospective observational study of endoscopic reports for upper gastrointestinal tract in patients with peptic diseases from October 2009 to September 2010 at the Endoscopic Unit, Department of Medicine, Rajavithi Hospital, which provides tertiary care as well as being a referral center from every hospital

in Thailand.

Peptic diseases were defined by endoscopic results that showed ulcer in the stomach, duodenum or swelling and erythema of the stomach, duodenal mucosa. Patients with peptic diseases were examined for the presence of *H. pylori* infection and their datas were taken from medical records. Only patients with gastric and duodenal lesions and complete records on either rapid urease test (RUT) or histology staining to identify *H. pylori* by Giemsa stain were enrolled for analysis. Those who were on treatment for *H. pylori* infection or previous treatment for this organism within one month before the present study or those with malignant gastric or duodenal lesions were excluded from the present study.

Test for H.pylori infection

Rapid urease test (RUT)

RUT was performed by taking one corpus and one antral biopsy for testing with the commercial testing urea kit, using the Pronto Dry test (Gastrex, Warsaw, Poland). Changing color from yellow to pink-red was interpreted as positive RUT for the presence of *H. pylori*.

Histology

Histology with the use of Giemsa stain for *H. pylori* infection was based on identification of the bacteria on the specimens taken from the corpus or antrum. Additional biopsies were taken from the ulcer edges to rule out malignant diseases if endoscopic appearance was unfavorable for a benign lesion. An ulcer was defined as a break of mucosa > 5 mm in depth. Malignant ulcers were differentiated from benign ulcers by the histologic appearance in the biopsy specimens.

The present study was compared with a previous study for peptic disease[22], which were collected in Rajavithi Hospital from 1993 to 1996 comprising 300 cases of peptic diseases about prevalence trends of *H. pylori* infection and peptic diseases.

Diagnosis of H. pylori infection

Diagnosis of *H. pylori* infection was based on gastric biopsy-based methods including rapid urease test or histology from gastric tissue. Patients with positive diagnostic results from any one of them were considered as *H. pylori* infection.

Statistical analysis

Chi-square test or Fishers' exact test was used for qualitative variables and the Student t-test for quantitative variables. Software for Windows version 17.0 (SPSS, Chicago, IL, USA) was then used for processing of data. A p-value of less than 0.05 was considered significant.

Results

Prevalence of H.pylori infection and demographic data

Five hundred and seventy patients (253 males and 317 females) with a mean age of 55.0 $\pm$ 16.02 years with peptic diseases were studied. The age ranged between 16 to 97 years. The prevalence of *H. pylori* infection was 64% (365 of 570). There was no difference of age (55.43 $\pm$ 16.25 vs. 54.22 $\pm$ 15.63 p = 0.280) and sex (p = 0.381) between the patients with and without *H.pylori* infection (Table 1).

Association of H.pylori infection with demographic data and clinical diagnosis

Endoscopic findings showed 106 GU patients (18.6%), 29 DU patients (5.1%), 3 combined GU and DU patients (0.5%) and 432 NUD patients (75.8%). The patients with age more than 50 years had more GU than the younger group (21.4-26.3% vs. 10.5-12.5%), less NUD (64.9-75% vs. 81.8-84.4%), but no difference in DU (Table 2).

There was more prevalence of NUD (82.3% vs. 67.6%), but less GU (14.2% vs. 24.1%) and DU (3.2% vs. 7.5%) in female patients than in male patients (Table 2). Prevalence of *H. pylori* infection were 61.3% of NUD cases, 68.9% of GU cases, 82.8% in DU cases and 100% in combined GU and DU cases (Table 3). Endoscopic findings in 365 *H. pylori* infection cases showed more prevalence of GU and DU (20.0% vs. 16.1%, 6.6% vs. 2.4%), but less prevalence of NUD (72.6% vs. 81.5%) than cases without *H. pylori* infection (Table 3). From logistic regression analysis, only DU had statistically significant association with *H. pylori* infection with odds ratio = 3.03 (95% CI 1.13-8.08, p = 0.027, Table 3).

Comparison of a previous study and current study of prevalence of H.pylori infection and peptic diseases in Rajavithi Hospital

Data from a previous study (Anantapunpong S. Rajavithi Med J 1999; 10: 17-26)[22], included 300 patients with dyspepsia, endoscopic findings showed 57 GU patients (19%), 31 DU patients (10.3%), 2 combined GU and DU patients (0.7%) and 210 NUD patients (70%) (Table 4). The prevalence of *H. pylori* infection was 49.7% overall, 84% in DU patients, 49%

Table 1. Comparison of age and sex of patients with and without *H.pylori* Infection (n = 570)

	H.pylori Positive	*H.pylori* Negative	p-value
Numbers of cases	365 (64.0)	205 (36.0)	
Age (years)			
Mean ± SD	55.43 ± 16.25	54.22 ± 15.63	0.391
< 30	24 (63.2)	14 (36.8)	
30-39	41 (62.1)	25 (37.9)	
40-49	61 (63.5)	35 (36.5)	
50-59	86 (58.1)	62 (41.9)	
60-69	75 (69.4)	33 (30.6)	
≥ 70	78 (68.4)	36 (31.6)	
Sex			0.381
Male	167 (66.0)	86 (34.0)	
Female	198 (62.5)	119 (37.5)	

Values are represented as n (%), Means ± SD

Table 2. Endoscopic diagnosis in patients with various age groups and sex (n = 570)

	NUD	GU	DU	GU+DU
Numbers of cases	432 (75.8)	106 (18.6)	29 (5.1)	3 (0.5)
Age (years)				
< 30	32 (84.2)	2 (5.3)	4 (10.5)	0 (0.0)
30-39	54 (81.8)	7 (10.6)	5 (7.6)	0 (0.0)
40-49	81 (84.4)	12 (12.5)	2 (2.1)	1 (1.0)
50-59	110 (74.3)	32 (21.6)	5 (3.4)	1 (0.7)
60-69	81 (75.0)	23 (21.3)	4 (3.7)	0 (0.0)
≥ 70	74 (64.9)	30 (26.3)	9 (7.9)	1 (0.9)
Sex				
Male	171 (67.6)	61 (24.1)	19 (7.5)	2 (0.8)
Female	261 (82.3)	45 (14.2)	10 (3.2)	1 (0.3)

Values are represented as n (%)

Table 3. Correlation between peptic diseases and *H.pylori* infection

	n	*H. pylori* Positive n = 365 (%)	*H. pylori* Negative n = 205 (%)	OR	95%CI	p-value
NUD	432	265 (61.3^{+}) (72.6^{++})	167 (38.7^{+}) (81.5^{++})	1.00		
GU	106	73 (68.9^{+}) (20.0^{++})	33 (31.1^{+}) (16.1^{++})	1.39	0.89-2.20	0.152
DU	29	24 (82.8^{+}) (6.6^{++})	5 (17.2^{+}) (2.4^{++})	3.03	1.13-8.08	0.027*
GU+DU	3	3 (100.0^{+}) (0.8^{++})	0 (0.0^{+}) (0.0^{++})	-	-	0.289

Values are represented as n (%), OR = Odds ratio, CI = Confidence Interval,
$^{+}$ = % of prevalence infection, $^{++}$ = % of endoscopic finding, * = Significance at $p < 0.05$

in GU patients, 50% in combined GU and DU patients and 45% in NUD patients (Table 5). Comparison with current data, the prevalence of DU was decreased (10.3% vs. 5.1%), but prevalence of other diseases were not changed (Table 4). The prevalence of *H. pylori* infection in overall and in DU were not changed (49.7%

Table 4. Comparison of peptic diseases and prevalences of *H.pylori* infection in previous study[22] vs. current study

Disease	Previous study	Current
NUD	210 (70.0)	432 (75.8)
GU	57 (19.0)	106 (18.6)
DU	31 (10.3)	29 (5.1)
GU+DU	2 (0.7)	3 (0.5)
Total	300 (100.0)	570 (100.0)

Values are represented as n (%)

Table 5. Comparison of *H.pylori* infection prevalence in a previous study[22] vs. current study

	Prevalence of *H.pylori* infection	
	Previous study	Current study
NUD	94 (45.0)	265 (61.3)
GU	28 (49.0)	73 (68.9)
DU	26 (84.0)	24 (82.8)
GU+DU	1 (50.0)	3 (100.0)
Total	149 (49.7)	365 (64.0)

Values are represented as n (%)

vs. 64% and 84% vs. 82.8%), but in NUD and GU were increased (45% vs. 61.3% and 49% vs. 68.9%, p = 0.013, Table 5).

Discussion

Helicobacter pylori is one of the most common chronic bacterial infections of humans and has a worldwide distribution. The prevalence of *H. pylori* infection varies from 10% to 90%, depending on age, geographic location and socioeconomic status of the populations[23,24]. In Thailand, the seroepidemiological study showed that the *H. pylori* infection rate increased with age from 17.5% of children aged 5 to 9 years old to 55% during the third decade of life, while a peak in infection was 75% of those 30 to 49 years of age[25]. But the study may not reflect true prevalence of infection because use of selorogy to diagnosis of *H. pylori* infection cannot separate past infection from current infection. Kachintorn et al, studied the prevalence of *H. pylori* infection in patients with GI symptoms in Siriraj Hospital, Bangkok, Thailand by urease test and histology, showed the prevalence of *H. pylori* infection 63.3% of all cases, 41.8% of NUD cases, 55.2% of GU cases, 67% in DU cases[21]. In the present study, the prevalence of *H. pylori* infection was 64% (365 of 570), not different from a previous study in Rajavithi Hospital[22]. The patients with age more than 50 years have more GU than the younger group, less NUD but no different in DU. It indicates that age may influence endoscopic findings especially gastric ulcer. Prevalence of *H. pylori* infection was 61.3% of NUD cases, 68.9% of GU cases, 82.8% in DU cases and 100% in combined GU and DU cases. Due to high prevalence of *H. pylori* infection in GU and DU , *H. pylori* infection still has been an important cause of peptic diseases especially in DU. Comparison with a previous study (Anantapunpong S. Rajavithi Med J 1999; 10: 17-26)[22], the prevalence of DU decreased but prevalence of other diseases were not change. These data indicate that the prevalence of *H. pylori* infection in symptomatic patients are varied. Many variations, including studied populations, bacterial strains, geographic locations, the efficacy of diagnostic methods, environmental and socioeconomic factors could be contributory factors. The present study also demonstrates findings consistent with other reports in Thailand[21,22,26], in that *H. pylori* infection was highly associated with DU.

Conclusion

The present study showed that the prevalence of *H. pylori* infection is still high in peptic diseases. *H. pylori* infection is strongly associated with DU, less associated with other peptic diseases. The patients with age more than 50 years have more GU, less NUD than the younger groups. Comparison with a previous study, the prevalence of DU decreased with statistically significance but prevalence of other diseases did not change. The prevalence of *H. pylori* infection in overall and in DU are not changed but in NUD and GU are increased

Potential conflicts of interest

None.

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ความชุกของการติดเชื้อ H.pylori ในผู้ป่วยโรคเป็ปติก

สยาม ศิรินธรปัญญา

***ภูมิหลัง**: การติดเชื้อ H. pylori เป็นสาเหตุสำคัญ ทำให้เกิดโรคต่างๆ เช่น แผลในกระเพาะอาหารและลำไส้เล็กส่วนต้น (peptic ulcer) กระเพาะอาหารอักเสบเรื้อรัง (chronic gastritis), เยื่อบุกระเพาะอาหารฝ่อ (atrophic gastritis), มะเร็งเยื่อบุท่อน้ำเหลือง (mucosal associated lymphoid tissue lymphoma), มะเร็งกระเพาะอาหาร (gastric cancer) ในช่วง 10 ปี ที่ผ่านมา มีรายงานว่ามีการลดลงของความชุกของการติดเชื้อ H. pylori และการเกิดแผลในทางเดินอาหารส่วนต้น ซึ่งปรากฏการณ์นี้พบได้ในหลายประเทศในทวีปเอเชียด้วย*

***วัตถุประสงค์**: หาความชุกของการติดเชื้อ H. pylori ในผู้ป่วยโรคเป็ปติกและหาความสัมพันธ์ของการติดเชื้อ H. pylori กับปัจจัยต่างๆ เช่น เพศ, อายุผู้ป่วย และเปรียบเทียบกับการศึกษาก่อนหน้า*

***วัสดุและวิธีการ**: ทำการศึกษาเชิงพรรณนาโดยเก็บข้อมูลย้อนหลังของผู้ป่วยที่ได้รับการตรวจพบโรคเป็ปติกโดยการส่องกล้องตรวจทางเดินอาหารส่วนต้น จากหน่วยทางเดินอาหาร กลุ่มงานอายุรศาสตร์ โรงพยาบาลราชวิถี ในช่วงระหว่างเดือนตุลาคม พ.ศ. 2552 ถึงเดือน กันยายน พ.ศ. 2553 บันทึกข้อมูลพื้นฐานของผู้ป่วย ข้อมูลการตรวจเชื้อ H. pylori ของกลุ่มประชากรต่างๆ และความสัมพันธ์ของการติดเชื้อกับปัจจัยต่างๆ*

***ผลการศึกษา**: ทำการศึกษาผู้ป่วยจำนวน 570 คน ที่ได้รับการตรวจพบโรคเป็ปติกโดยการส่องกล้องตรวจทางเดินอาหารส่วนต้น ตรวจพบแผลในกระเพาะอาหาร (GU) 106 ราย (18.6%), แผลในลำไส้เล็ก(DU) 29 ราย (5.1%), แผลในกระเพาะอาหารร่วมกับแผลในลำไส้เล็ก (GU และ DU) 3 ราย (0.5%) และกระเพาะอาหารหรือลำไส้เล็ก อักเสบและตรวจไม่พบแผล (NUD) 432ราย (75.8%) ความชุกของการติดเชื้อ H.pylori โดยรวมเท่ากับ 64% (365 ใน 570 คน), 61.3%ในผู้ป่วย NUD, 68.9% ในผู้ป่วย GU, 82.8% ในผู้ป่วย DU และ 100% ในผู้ป่วยที่มีทั้ง GU และ DU เปรียบเทียบกับการศึกษาก่อนหน้านี้พบว่าความชุกของการติดเชื้อ H. pylori โดยรวมและ ใน DU ไม่เปลี่ยนแปลงไปจากเดิม (49.7% vs. 64.0%, และ 84.0% vs. 82.8%) แต่ความชุกของการติดเชื้อเพิ่มขึ้นใน NUD และ GU (45.0% vs. 61.3% และ 49.0% vs. 68.9%)*

***สรุป**: ความชุกของการติดเชื้อ H. pylori ยังอยู่ในระดับสูง ในผู้ป่วยอายุมากกว่า 50 ปี ตรวจพบมีแผลในกระเพาะอาหารได้บ่อยกว่าแต่พบ NUD ได้น้อยกว่าผู้ป่วยที่มีอายุน้อยกว่า เปรียบกับการศึกษาก่อนหน้านี้พบว่าความชุกของการติดเชื้อ H. pylori โดยรวมและในแผลในลำไส้เล็กส่วนต้นไม่เปลี่ยนแปลงไปจากเดิม แต่ความชุกของการติดเชื้อเพิ่มขึ้นในผู้ป่วยกลุ่ม NUD และแผลในกระเพาะอาหาร*