

## Prevalence of GERD in a community-based examination in Thailand

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- Background** : *Gastroesophageal reflux disease (GERD) is highly prevalent, affecting 10 - 30% of the population in Western countries. In Asia, the prevalence of GERD is lower, ranging from 2.5 - 7.1% in most population-based studies. Recently, GERD has been increasingly encountered in clinical practices in Asian countries.*
- Objectives** : *To describe the prevalence of GERD in a community-based endoscopic examination in Thailand and to assess the relationship between the endoscopic findings of esophagitis and GERD symptoms.*
- Materials and Method** : *The adults aged of at least 18 years old with uninvestigated dyspeptic symptoms or the adults aged of at least 55 years old with or without alarming symptoms were invited to participate voluntary. Esophagogastroduodenoscopy (EGD) was performed in 2,488 participants from 5 different geographic regions of Thailand. A questionnaire was used to inquire the specific GERD symptoms in all participants. The cardinal symptoms of GERD are heartburn, acid reflux and food regurgitation. Endoscopic findings were recorded and an antral biopsy was performed and tested for Helicobacter pylori using a rapid urease test (Pronto dry). The endoscopic finding of esophagitis was correlated with reflux symptoms in each subject.*

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- Results** : *There were 2,488 participants in this community-based endoscopic examination study, consisting of 785 men (31.6%) and 1,703 women (68.4%) with the mean  $\pm$  SD age of 50.2  $\pm$  11.9 years. There were 62.8% of participants (n = 1563) with dyspeptic symptoms whereas 37.2% of the participants (n = 925) were asymptomatic. We found typical reflux symptoms in 855 participants (34.4%); 143 of them had only reflux symptoms and 712 had overlapping symptoms of GERD and dyspepsia. Alarm symptoms, which included significant weight loss and dysphagia, were found in 13.3% (n = 330). Of 855 participants with typical reflux symptoms, only 6.2% of them (n = 53) had endoscopic esophagitis, whereas the group without typical reflux symptoms, including those with asymptomatic and dyspeptic participants (n = 1,633), endoscopic esophagitis was detected in 4.8% (n = 78). The majority of endoscopic esophagitis patients were of mild degree (LA class A = 93%). Participants with typical reflux symptoms (n = 313) had *H. pylori* infection rate of 36.6% which was significantly lower than those participants without the typical reflux symptoms (n = 686; 42%, *P* = 0.01) whereas *H. pylori* infection rate was not different in participants with or without endoscopic esophagitis.*
- Conclusion** : *From our community-based endoscopic examination study, the prevalence of GERD using typical reflux symptoms is about one-third (34.4%) whereas only 6.2% of them had endoscopic esophagitis with mild esophagitis predominantly. This suggests that non-erosive reflux disease (NERD) is the most common category of GERD among the Thai participants who experienced typical reflux symptoms.*
- Keywords** : *GERD, community-based examination, prevalence.*

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- ที่มาของงานวิจัย** : ความชุกของโรคกรดไหลย้อนในประเทศตะวันตกอยู่ในช่วงร้อยละ 10 - 30 แต่ในประเทศเอเชียมีความชุกที่น้อยกว่าคือ ประมาณร้อยละ 2.5 - 7.1 โดยที่ในปัจจุบันความชุกในเอเชียมีอัตราที่เพิ่มขึ้น
- วัตถุประสงค์** : เพื่อหาความชุกของโรคกรดไหลย้อนในประเทศไทย โดยใช้การกล้องส่องทางเดินอาหารส่วนต้น และต้องการประเมินความสัมพันธ์ระหว่างภาวะหลอดอาหารอักเสบกับอาการ กรดไหลย้อน
- วิธีการวิจัย** : ทำการศึกษาแบบการสำรวจประชากรในพื้นที่ ค้นหาผู้ป่วยที่มีอาการจุกแน่นท้องโดยใช้แบบสอบถามอาการปวดท้องโดยอาการเฉพาะของกรดไหลย้อนครบทั้ง 3 อาการ คือ แสบยอดอก เรอเปรี้ยว และลำไส้กลางอาหาร ผู้ป่วยทุกคนจะได้รับการตรวจสอบกล้องทางเดินอาหารส่วนต้น คือ ตั้งแต่หลอดอาหาร กระเพาะอาหารและลำไส้เล็กส่วนต้นดูโอดินัม บันทึกสิ่งที่พบร่วมกับตัดชิ้นเนื้อส่วนแอนทรม์ในกระเพาะอาหาร เพื่อตรวจหาเชื้อเฮลิโคแบคเตอร์ ไพโลไร รวบรวมผู้ป่วยได้จำนวน 2,488 คน ใน 5 ภูมิภาคของประเทศไทย
- ผลการศึกษา** : พบว่าผู้ป่วย 2,488 คน เป็นผู้ชาย 785 คน (31.6%) และ ผู้หญิง 1,703 คน (68.4%) อายุเฉลี่ย  $50.2 \pm 11.9$  ปี มีอาการปวดท้องได้ลิ้นปี 1,563 คน (62.8%) ไม่มีอาการ 925 คน (37.2%) และมีอาการกรดไหลย้อนครบทั้ง 3 อาการรวม 855 คน (34.4%) มีอาการเรอเปรี้ยวอย่างเดียว 143 คน (5.7%) อาการรวมปวดท้องได้ลิ้นปีกับกรดไหลย้อน 712 คน (28.6%) สำหรับอาการเตือนที่บ่งชี้ว่าอาจมีโรคที่รุนแรง เช่น น้ำหนักลดลงอย่างมาก กลืนอาหารไม่ได้ พบจำนวน 330 คน (13.3%) สำหรับผู้ป่วยที่มีอาการกรดไหลย้อนครบทั้ง 3 อาการจำนวน 855 คน มีเพียง 53 คน (6.2%) ที่พบหลอดอาหารอักเสบจากการตรวจสอบกล้องทางเดินอาหารส่วนต้น ในขณะที่กลุ่มไม่มีอาการและกลุ่มที่มีอาการปวดท้องได้ลิ้นปีเพียงอย่างเดียวจำนวน 1,633 คน มีเพียง 78 คน (4.8%) ที่พบหลอดอาหารอักเสบจากการตรวจสอบกล้องทางเดินอาหารส่วนต้น สำหรับกลุ่มที่ยืนยันว่ามีหลอดอาหารอักเสบ พบว่าส่วนใหญ่หรือ 93% มีความรุนแรงระดับเล็กน้อย (the Los Angeles classification for erosive esophagitis; LA class A)

**สรุปผล**

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ผู้ป่วยที่มีอาการกรดไหลย้อนครบทั้ง 3 อาการจำนวน 855 คน มี 313 คน ที่ตรวจพบการติดเชื้อเฮลิโคแบคเตอร์ ไพโลไร (36.6%) ซึ่งพบน้อยกว่า กลุ่มไม่มีอาการและกลุ่มที่มีอาการปวดท้องใต้ลิ้นปี่เพียงอย่างเดียวอย่างมีนัยสำคัญทางสถิติ ( $n = 686/1,633$ ; 42%,  $P = 0.01$ ) ในขณะที่อัตราการติดเชื้อเฮลิโคแบคเตอร์ ไพโลไรไม่ได้มีความแตกต่างกันในกลุ่มที่มีและไม่มีหลอดอาหารอักเสบจากการตรวจสอบกล้องทางเดินอาหารส่วนต้น ความชุกของโรคกรดไหลย้อนโดยใช้อาการครบ 3 อาการ คือ 34.4% ( $n = 855$  คน) ซึ่งพบว่ามีเพียง 6.2% ( $n = 53$ ) ที่มีอาการหลอดอาหารอักเสบเล็กน้อยจากการตรวจยืนยันด้วยการส่องกล้องทางเดินอาหารส่วนต้น ดังนั้นภาวะที่มีอาการคล้ายโรคกรดไหลย้อนโดยไม่มีควมผิดปกติจากการการตรวจสอบกล้องทางเดินอาหารส่วนต้นหรือที่เรียกว่า non-erosive reflux disease เป็นกลุ่มที่พบได้มากที่สุด

**คำสำคัญ**

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GERD (Gastroesophageal Reflux Disease) is a chronic relapsing disease with typical symptoms including heartburn, acid reflux and regurgitation. GERD is highly prevalent in Western countries, affecting 10 - 30% of the population. The prevalence in most Asian community-based studies is less than 10%, but there is a wide variation between East Asia and West Asia.<sup>(1,2)</sup> Currently, GERD has received an increasing concern in clinical practices in Asia due increased awareness and better recognition of the disease entity. Nevertheless, there is no gold standard for the diagnosis of GERD since there is a poor correlation among symptomatology, endoscopic findings and 24 hr-pH monitoring. Patients may be diagnosed based on typical symptoms alone or with the help of some diagnostic tests. The diagnostic test that demonstrates the reflux of acid content by 24 hr-pH monitoring is not yet widely available in Thailand except in certain research centers and does not always correlated with the symptoms. GERD is best diagnosed using the cardinal symptoms of heartburn and regurgitation.<sup>(3,4)</sup> This is practical for the diagnosis of GERD in clinical settings. So far, endoscopy is the best test to document esophagitis but the findings may or may not correlate well with symptomatology. We conducted a study of a community-based endoscopic examination in 5 different regions of Thailand to describe the prevalence of GERD and to determine the relationship between the reflux symptoms and endoscopic esophagitis.

### Materials and Methods

A community-based endoscopic examination was conducted in 5 different regions of Thailand from

2006 through 2009. The adults aged of at least 18 years old with uninvestigated dyspeptic symptoms or the adults aged of at least 55 years old with or without alarming symptoms were invited to participate voluntarily. Prior to endoscopy, we recorded all relevant clinical and demographic information by using a questionnaire. Specifically, the questionnaire covered gastrointestinal related complaints such as abdominal pain, reflux symptoms, bowel habits, and GERD alarm symptoms. History of alcohol drinking, smoking and other medical conditions were also recorded. A written informed consent was obtained from each participant prior to enrollment. The study has been approved by the ethics committee of the Faculty of Medicine, Chulalongkorn University. All participants underwent upper gastrointestinal endoscopy and were tested for *H. pylori* infection by a rapid urease test (pronto dry). In case of suspicion of malignancy, biopsy was done for pathological study. Endoscopic esophagitis was defined according to the Los Angeles classification of erosive esophagitis (LA classification).<sup>(5, 17)</sup>

### Statistical analysis

Categorical data were presented as numbers (percentage) and were compared by Fisher exact test or Chi-square test where appropriate. Continuous variables were presented as mean  $\pm$  standard deviation (SD). Comparisons between the two groups were performed using independent *t*-test if values were normally distributed or using the Wilcoxon rank sum test if the distribution was not normal. All tests were two-sided, and *P*-value  $<0.05$  is considered statistically significant.

## Results

We conducted a large scale study of a community-based endoscopic examination in 5 different regions of Thailand. A total of 2,488 participants were enrolled, consisting of 785 men (31.6%) and 1,703 women (68.4%) with the mean  $\pm$  SD age of  $50.2 \pm 11.9$  years. There were 62.8% of participants ( $n = 1,563$ ) with dyspeptic symptoms whereas 37.2% of participants ( $n = 925$ ) were asymptomatic as shown in Table 1 - 2. We found the typical reflux symptoms in 855 participants (34.4%); 143 of them had only reflux symptoms and 712 had overlapping symptom of GERD and dyspepsia. The alarm symptoms, which included significant weight loss and dysphagia, were found in 13.3% ( $n = 330$ ). Of 855 participants with typical reflux symptoms, only 6.2% of them ( $n = 53$ ) of endoscopic esophagitis, whereas the group without typical reflux symptoms, including those with asymptomatic and dyspeptic participants ( $n = 1633$ ), endoscopic esophagitis was

detected in 4.8% ( $n = 78$ ) as shown in Table 3 - 4. The majority of endoscopic esophagitis patients were of mild degree (LA class A = 93%). Esophageal cancer was found only in 1 patient (0.04%), and gastric cancer in 2 patients (0.08%). Twenty-five of the 131 patients with endoscopic esophagitis had history of alcohol drinking and 10 patients reported current smoking. The body mass index was not a predictor of more severity of endoscopic esophagitis.

Table 5 shows that participants with typical reflux symptoms ( $n = 313$ ) had *H. pylori* infection rate of 36.6% which was significantly lower than those participants without typical reflux symptoms ( $n = 686$ ; 42%,  $P = 0.01$ ). The rate of *H. pylori* infection in 131 patients with endoscopic esophagitis was 34.4% ( $n = 45$ ), which is not different from *H. pylori* infection rate in those patients without endoscopic esophagitis group ( $n = 954/2,357$ ; 40.5%) ( $P = 0.17$ ) as shown in Table 6.

**Table 1.** Demographic data and presenting symptoms of study participants.

Variable category: Number (%)		Study population (n = 2,488)
Gender	Male	785 (31.6%)
	Female	1,705 (68.4%)
Age (years)	mean $\pm$ SD	$50.2 \pm 11.9$
Geographic region	North	591 (23.7%)
	Central	702 (28.2%)
	Northeast	754 (30.3%)
	East	62 (2.5%)
	South	379 (15.2%)
Nicotine use, Current smoker		218 (8.8%)
Alcohol use		528 (21.2%)
Presence of dyspeptic symptoms		1,563 (62.8%)
Presence of reflux symptoms		855 (34.4%)
Presence of alarm symptoms		330 (13.3%)

**Table 2.** Endoscopic findings.

Endoscopic findings	Number (%)
NUD (normal or gastritis)	1,826 (73.4%)
GU/ erosion	352 (14.1%)
DU/ duodenitis	108 (4.3%)
GU and DU	19 (0.8%)
Esophagitis	131 (5.3%)
Gastric cancer	2 (0.08%)
Esophageal cancer	1 (0.04%)
Others (gastric polyps or varices)	49 (2%)

**Table 3.** Distribution of reflux symptoms, endoscopic esophagitis and percentage of *H. pylori* infection by geographic region.

Region	Total number of participants enrolled (%)	Typical reflux symptoms (%)	Endoscopic esophagitis (%)	Rate of <i>H. pylori</i> infection (%)
North	591 (23.7%)	227 (38.4%)	15 (2.5%)	46.5%
Central	702 (28.2%)	241 (34.3%)	55 (7.8%)	32.2%
Northeast	754 (30.3%)	241 (32%)	36 (4.8%)	55%
East	62 (2.5%)	21 (33.9%)	3 (4.8%)	27.4%
South	379 (15.2%)	125 (33%)	22 (5.8%)	17.4%

**Table 4.** Endoscopic findings in participants with and without typical reflux symptoms.

Endoscopic findings	With typical reflux symptoms (855 cases)	Without typical reflux symptoms (1,633 cases)	P value
Normal or gastritis	623 (72.9%)	1,203 (73.7%)	0.67
Esophagitis	53 (6.2%)	78 (4.8%)	0.13
GU or gastric erosions	110 (12.9%)	242 (14.8%)	0.18
DU or duodenitis	47 (5.5%)	61 (3.7%)	0.04
GU and DU	7 (0.8%)	12 (0.7%)	0.82
Esophageal cancer	1 (0.1%)	0	0.34
Gastric cancer	0	2 (0.1%)	0.54

**Table 5.** Presence of *H. pylori* infection in participants with and without reflux symptom.

<i>H. pylori</i> infection	with typical reflux symptoms (855 cases)	without typical reflux symptoms (1,633 cases)
Positive	313 (36.6%)	686 (42%)
Negative	542 (63.4%)	947 (58%)

**Table 6.** Presence of *H. pylori* infection in participants with and without endoscopic esophagitis.

<i>H. pylori</i> infection	With endoscopic esophagitis (131 cases)	Without endoscopic esophagitis (2,357 cases)
Positive	45 (34.4%)	954 (40.5%)
Negative	86 (65.6%)	1,403 (59.5%)

## Discussion

Our study was the large community-based endoscopic examination in Thailand that which enrolled participants from a diversity of geographical locations. According to the enrollment of uninvestigated dyspeptic subjects, most of the screened patients (>90%) were investigated with EGD. Most patients had difficulty to access the endoscopic examination thus they had high tendency to cooperate well for the provided investigations and may over-reported the questionnaire for gastrointestinal related complaints. The typical GERD symptoms (heartburn, food and acid regurgitation) were commonly found (n = 855, 34.4%) although the degree of severity was usually mild. Of 855 participants with typical GERD, 143 of them (5.7%) had only the reflux symptoms whereas most participants with typical GERD symptoms had overlapping dyspeptic symptoms. There were more

frequency of women (68%) than men in our study.

This finding may be explained by the more number of men working during the daytime and Thai women had more concerned in health problems than those in men.

Clinical significant endoscopic findings were found in 28.9% of the study participants' population with typical GERD symptoms and/or dyspeptic symptoms. Endoscopic esophagitis was found only in 5.8% of the overall participants in this study. The number of cancer patients was very low in our examination: 1 case of esophageal cancer and 2 patients of gastric cancer. The mild end of spectrum of GERD's severity found in this study may be explained by the nature of the study design, instead of using hospital based patients. Participants in the community based examination were likely to have milder symptoms as oppose to participants with more severe symptoms seeking medical care in hospitals. We found alarm symptoms up to 13.3% in this



population. The alarm symptoms consisted of dysphagia and unexplained by significant weight loss. There was no relationship between the alarm symptoms and endoscopic findings; however, the limitation of our study is the small number of cancer patients. A previous study in Canadian adults reported only 2.8% with alarm symptoms which was not related to the cancer findings.<sup>(6)</sup> In our study, all the 3 patients of our patients with cancer had alarm symptoms. Thus, the alarm symptoms may be not a good predictor of malignancies in a community-based examination.

GERD is a complex clinical condition with heterogeneous symptom patterns. In our study, neither participants with pure GERD symptoms nor overlapping GERD symptoms with dyspepsia predicted the presence of esophagitis. We found poor relationship between the reflux symptoms and endoscopic findings. The majority of participants with typical GERD symptoms in our study did not have endoscopic esophagitis. In addition, PUD was found in 19.2% and NUD in 73.4%. A previous study showed specificities of heartburn and regurgitation to be 89% and 95% respectively, but sensitivity was very low, only 6% - 38%.<sup>(7)</sup>

We did not evaluate, however, the effect of empirical PPI treatment in participants with typical GERD symptoms in our study. PPI test may be used as first modality before endoscopic diagnosis in our community because of low prevalence and mild severity of esophagitis. Participants with non-erosive reflux disease (NERD) are the commonest spectrum in this population and it will likely respond to PPI or even H<sub>2</sub>-blocker because of the mild symptoms. This suggests that the empirical therapy should be

considered as the initial therapy to avoid the unnecessary endoscopy in participants who have mild symptoms. The prompt upper endoscopy may be reserved as a diagnostic tool in those with typical GERD symptoms who do not respond to medical treatment.

From our community-based endoscopic examination, the prevalence of GERD using the typical reflux symptoms is about one-third (34.4%) where as only 6.2% of them (n = 53) had endoscopic esophagitis with mild esophagitis predominantly. This prevalence is not different from a previous study done in Korea which found that the prevalence of GERD was 5%.<sup>(8)</sup> and the prevalence of endoscopic esophagitis was 8%. Moreover, the prevalence of at least weekly heartburn and/or acid regurgitation in other Asian countries has been reported below 7%.<sup>(9)</sup>

<sup>16)</sup> Our findings fail to support the protective role of *H. pylori* against GERD. Participants with typical reflux symptoms had *H. pylori* infection rate of 36.6% which was significantly lower than those participants without typical reflux symptoms (42%, P = 0.01) where as *H. pylori* infection rate was not different in participants with or without endoscopic esophagitis. Our study has some limitations. First, we did not collect the data of the screened subject who did not received endoscopic evaluation to compare with those receiving the endoscopic examination. Second, most of our patients in the community were female who had dyspeptic symptoms and more concerned in health problems thus the data of symptoms may be over-reported. Last, our study was a cross sectional study which has limitation to evaluate the long-term outcomes of GERD treatment.

## Conclusions

From our community-based endoscopic examination study, the prevalence of GERD using typical reflux symptoms is about one-third (34.4%) whereas only 6.2% of them had endoscopic esophagitis with mild esophagitis predominantly. This suggests that non-erosive reflux disease (NERD) is the most common category of GERD among the Thai participants who experienced typical reflux symptoms.

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