

## Upper Gastrointestinal Symptoms in Thai Patients with GERD Diagnosed by 24-hour pH Monitoring

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### ABSTRACT

**Background:** Heartburn and acid regurgitation have been recognized as specific GERD symptoms in western country. Whether these symptoms specific for GERD in Thai patients have not been well explored .

**Objective:** To determine the association between upper GI symptoms and GERD as determined by 24-hour esophageal pH monitoring.

**Patients and Methods:** Ninety-eight patients with upper GI symptoms (22 males, 76 females, age 15-80 years) underwent 24 hour esophageal pH monitoring. Peptic ulcer disease and gastric cancer were excluded by esophagogastroduodenoscopy (EGD) . All patients were interviewed about their upper GI symptoms by a gastroenterologist. Upper GI symptoms were evaluated including; heartburn, acid regurgitation, abdominal fullness, early satiety, nausea, epigastrium pain/discomfort, dysphagia and globus sensation.

**Results:** There were 53 GERD patients (17 males, 36 females, age  $46.11 \pm 14.203$ ). GERD patients had more reflux episodes and percent time pH <4 than non GERD patients. GERD patients had significant more weight than non GERD patients ( $p = 0.028$ ) . There were no significant different of the upper GI symptoms between GERD and non GERD patients.

**Conclusion:** For diagnosis of GERD, clinical presentations alone were not reliable and physician may need other methods for diagnosis of GERD such as PPI test, which warrant further research study.

**Key words :** Upper Gastrointestinal, symptoms, GERD, 24-hour pH monitoring

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## BACKGROUND

Gastroesophageal reflux disease (GERD), defined as the presence of symptoms or lesions that can be attributed to the reflux of gastric content into the esophagus, is one of the most common disorders affecting the gastrointestinal tract<sup>(1)</sup>. Heartburn and acid regurgitation are considered highly sensitive and specific symptoms for GERD, both especially if provoked by eating, bending over, or lying supine. When heartburn or acid regurgitation clearly dominated the patient's complaints, they had very high specificity (89% and 95%, respectively) but low sensitivity (38% and 6%) for GERD<sup>(2)</sup>.

DIGEST study reported prevalence of upper abdominal symptoms ranged from 8-54%, 10-48% for heartburn, 9-45% for acid regurgitation and 21-59% for both heartburn and acid regurgitation<sup>(3)</sup>. While Study from USA reported 5-7% of patients had heartburn everyday, 19.8% of patients had heartburn every week and 40% of population had heartburn once a month<sup>(4)</sup>. Typical gastroesophageal reflux symptoms were common conditions, but mainly of mild or moderate degree<sup>(5)</sup>.

Other factors associated with GERD were excessive body weight, which was a significant independent risk factor for hiatal hernia and was significantly associated with esophagitis, largely through an increased incidence of hiatal hernia<sup>(6)</sup>. However, another study reported that high BMI did not appear to be a risk indicator for GERD<sup>(7)</sup>.

Esophagogastroduodenoscopy (EGD) was the best way to evaluate suspected complications of GERD, but endoscopic findings were insensitive for the presence of pathological reflux, and therefore they could not reliably exclude GERD<sup>(8)</sup>. EGD had been found to have sensitivity of only 30-68%. The gold standard study for confirming or excluding the presence of abnormal gastroesophageal reflux was 24-hour esophageal pH monitoring test. The combination of 24-hour esophageal pH monitoring and esophageal manometry allowed for 82% sensitivity and 100% specificity, furthermore, the positive predictive value of these two combined tests were 100%, and negative predictive value were 85%<sup>(9)</sup>.

## OBJECTIVES

The aim of the study was to identify the specific

symptoms for GERD in Thai patients diagnosed by 24-hour esophageal pH monitoring.

## PATIENTS AND METHODS

Consecutive patients with upper abdominal symptoms suspected GERD were asked for complete a detailed questionnaire on symptoms severity and frequency, age, height, and weight. All patients underwent upper gastrointestinal endoscopy followed by 24-hour esophageal pH monitoring when no endoscopic abnormalities or unidentified cause of esophagitis was detected.

Patients were eligible for the study if they had upper gastrointestinal symptoms suspected GERD, age 15-80 years, no endoscopic abnormalities except unidentified cause of esophagitis. Exclusion criteria were patients who treated with anti-acid therapy, anti-motility, calcium channel blocker, nitrates or sedative drugs. Patients who had severely illness. These patients should stop PPI at least 7 days and stop other drugs mentioned above at least 2 days.

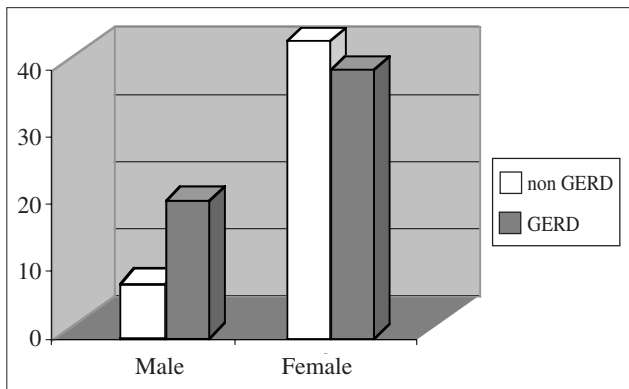
All patients answered a 14 upper gastrointestinal symptoms questionnaire (heartburn, acid regurgitation, abdominal fullness, nausea, vomiting, epigastrium pain/discomfort, dysmotility, globus sensation, dysphagia, hiccup, early satiety, belching). They scored for degree of severity using a numerical score defined as 0 = absent, 1 = mild, 2 = moderate and 3 = severe.

## Statistical Analysis

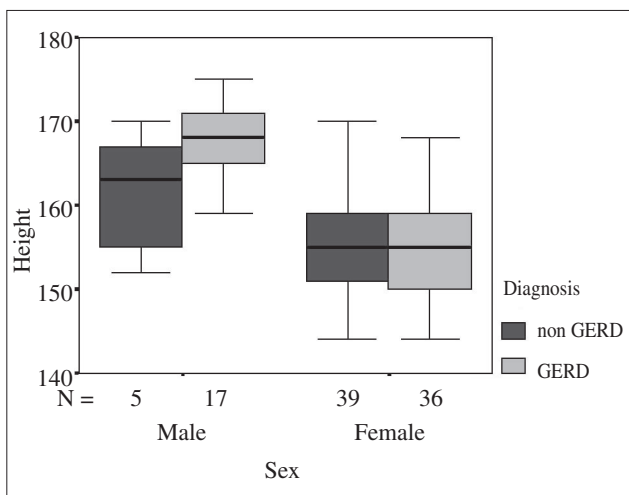
Descriptive data were analysed by SPSS version 11.0 for window. Values were expressed as mean  $\pm$  SD and percentage. Compared the symptoms by using Chi-square test. Considered statistical significant when  $p < 0.05$ .

## RESULTS

There were 98 patients with upper gastrointestinal symptoms suspected GERD (22 males, 76 females). In GERD patients, there were 17 males and 36 females. Males had significant more percentage of GERD than female ( $p = 0.011$ ) (Figure 1). Mean age of GERD patients group was  $46.11 \pm 14.20$  years and non GERD patients group was  $44.24 \pm 12.13$  years which was not statistical significance ( $p = 0.49$ ). Mean height of GERD patients group was  $158.98 \pm 7.84$  cm compared to  $156.32 \pm 6.21$  cm in non GERD patients group which



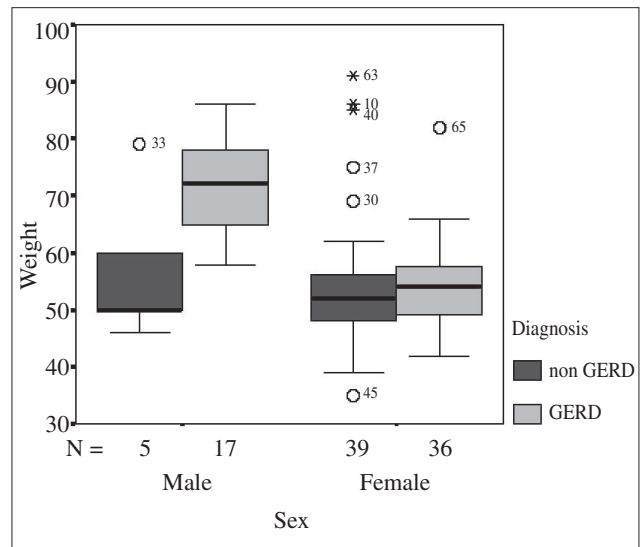
**Figure 1** Presenting correlation between sex in GERD and non GERD patients



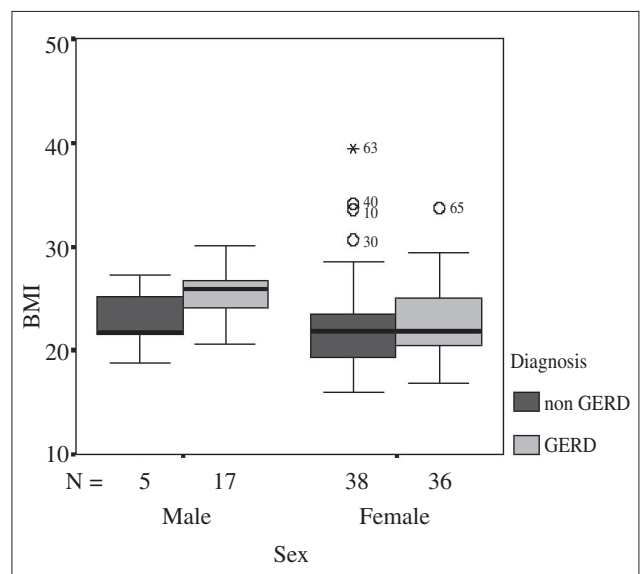
**Figure 2** Compared height in GERD and non GERD patients defined by sex

was not statistic difference ( $p = 0.071$ ) (Figure 2). Mean weight of GERD patients group was  $59.80 \pm 11.31$  kg and non GERD patients group was  $54.42 \pm 12.36$  kg which was statistically different ( $p = 0.028$ ), but we could not find this difference in BMI (Figure 3,4).

Heartburn was the specific symptom for diagnose GERD in western country, but in this study there were 53 GERD patients. Only 22 patients had heartburn, of these 11 patient had mild, 7 patients had moderate and 4 patients had severe symptom. If we separated heartburn patients to 4 groups, there were different with statistic significance ( $p = 0.048$ ). But if we separated no heartburn symptom in one group, and mild, moderate, severe heartburn in another group, they were not statistic significance ( $p = 0.242$ ) which sensitivity and specificity were 42% and 69% respectively (Table 1).



**Figure 3** Compared weight in GERD and non GERD patients defined by sex



**Figure 4** BMI, compared BMI in GERD and non GERD patients defined by sex

Acid regurgitation is the another specific symptom for diagnose GERD. In this study 21 patients had mild symptom, 10 patients had moderate symptom and 3 patients had severe symptom. There were not statistic difference ( $p = 0.223$ ), which sensitivity and specificity were 64% and 51% respectively (Table 2).

Other upper gastrointestinal symptoms (abdominal fullness, nausea, vomiting, epigastrium pain/discomfort, dysmotility, globus sensation, dysphagia, hic-

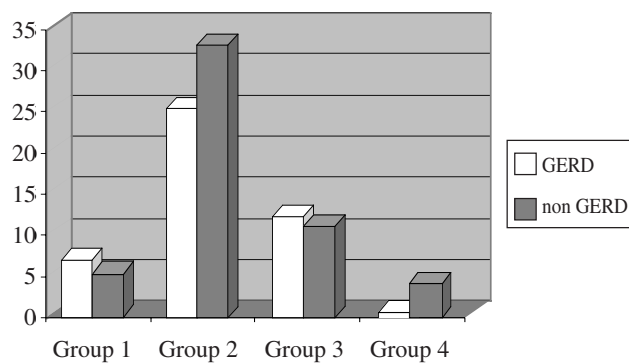
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**Table 1** Number of patients in different severity of heartburn symptom

Severity	Diagnosis		Total
	Non GERD	GERD	
Heartburn no	31	31	62
mild	1	11	12
moderate	8	7	15
severe	5	4	9
<b>Total</b>	<b>45</b>	<b>53</b>	<b>98</b>

**Table 2** Number of patients in different severity of acid regurgitation

Severity	Diagnosis		Total
	Non GERD	GERD	
Acid regurgitation no	23	19	42
mild	11	21	32
moderate	6	10	16
severe	5	3	8
<b>Total</b>	<b>45</b>	<b>53</b>	<b>98</b>



**Figure 5** Compared number of patients in 4 clinical pattern between GERD and non GERD patients

cup, early satiety and belching) were not significant difference also.

We had to define patients into 4 groups : group 1 had heartburn and reflux regurgitation, group 2 had dyspepsia and dysmotility, group 3 had dysphagia and globus sensation and group 4 had mixed symptom. There were not different in symptom pattern between GERD and non GERD patients (Figure 5).

## DISCUSSION

Even heartburn and acid regurgitation were specific symptoms for diagnosis GERD in western country, but in this study, the result was not. The sensitivity and specificity for diagnosis GERD were 42% and 69% in heartburn while sensitivity and specificity for diagnosis were 64% and 51% in acid regurgitation. Both symptoms were quite lower specificity compared to Western literature. Okamoto K, et al studied in 8,031 patients with endoscopic reflux esophagitis reported that endoscopic esophagitis was not equivalent to any reflux symptoms from which subjects suffered in their daily lives<sup>(10)</sup>. Although our study included patients with non-erosive esophagitis (NERD) but there was early study reported that NERD-positive patients (abnormal pH test) had a similar extent of esophageal acid exposure to those with erosive esophagitis<sup>(11)</sup>. Ott DJ, *et al* reported pH monitoring findings did not correlate with presence or absence of heartburn<sup>(12)</sup>. Heartburn and regurgitation were specific for GERD when they were the predominant symptoms, but prove to be insensitive when the diagnosis of GERD was based on the measurement of esophageal acid exposure<sup>(13)</sup>.

Other upper gastrointestinal symptoms in this questionnaire were not statistic significance also There were not upper gastrointestinal symptoms which was specific for diagnosis GERD in Thai patients. There was a study identified correlation between belching and GERD. Because either belching or heartburn may result from transient lower esophageal sphincter relaxations, it has been proposed that belching may be a manifestation of GERD. This study found that belching was as common and as severe in patients with dyspepsia as it was in patients with GERD, because belching cannot be clinically used as a discriminatory symptom, ambulatory pH monitoring should be considered to elucidate the relationship of belching to acid reflux in patients with dyspepsia or GERD<sup>(14)</sup>.

Female were diagnosed GERD more than male ( $p = 0.013$ ). The early study reported that female tolerated to esophageal balloon distention in esophagus (pain threshold) less than male<sup>(15)</sup>. Mean weight in GERD patients group was statistic significant higher than non GERD patients group but the difference was not seen in mean height, there were 158.98 cm and 59.80 kg in GERD patients compared to 156.32 cm and 54.42 kg, respectively. We concluded that GERD patients were more weigh than non GERD patients.

About weight and GERD, they found that morbidly obese patients with abnormal reflux scores weighed significantly more and had greater body mass indices than patients with normal scores ( $p < 0.05$ )<sup>(16)</sup>. The pathophysiology of GERD differs between obese and lean subjects. First, obese subjects were more sensitive to the presence of acid in the esophagus. Second, hiatal hernia, capable of promoting GERD by several mechanisms, was more prevalent among the obese. Third, obese subjects had increased intra-abdominal pressure that displaces the lower esophageal sphincter and increases the gastro-esophageal gradient. Finally, vagal abnormalities associated with obesity may cause a higher output of bile and pancreatic enzymes, which make the refluxate more toxic to the esophageal mucosa<sup>(17)</sup>. Other etiology was esophageal length. From the old literatures, they found no correlation between weight, age, sex and esophageal length but the correlation between height and esophageal length was confused<sup>(18-20)</sup>.

### CONCLUSION

There were not specific symptoms for diagnosis GERD in Thai patients, perhaps we need another tests such as PPI test to confirm the diagnosis.

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