Relationship between Gastroesophageal Reflux Disease Questionnaire (GERD-Q) Score and Reflux Oesophagitis in Gastroesophageal Reflux Disease (GERD) Suspected Patients in Bandung

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ABSTRACT

Background: *Gastroesophageal reflux disease is a disease with heterogen symptoms, with no gold standard available to diagnose this condition. Questionnaire is a diagnostic tool that may enable an objective symptom assessment. GERD-Q questionnaire consist of 6 components of questions, formed from 4 various components of reflux symptoms (positive predictors of GERD) and 2 as negative predictors of GERD. This study aimed to observe the relationship between GERD-Q score and reflux oesophagitis in GERD suspected patients.*

Method: *This study was an analytic cross-sectional study, conducted in March to July 2019. Study participants were patients visiting the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital, who were then evaluated using GERD-Q and later underwent endoscopy examination. The severity of reflux oesophagitis observed through endoscopy was evaluated using the Los Angeles classification. Endoscopy readings was performed by one experienced doctor.*

Results: *Thirty-six patients were examined; 17 (47.2%) patients suffered from reflux oesophagitis, including 13 cases with grade A (76.5%) and 4 cases with grade B (23.5%). There were no cases with grade C or grade D was found. Patients who suffered from reflux oesophagitis with GERD-Q score ≥ 8 were 15 patients (65.2%) and GERD-Q score < 8 were 2 patients (15.4%). Chi Square test analysis with confidence interval of 95% revealed $p = 0.004$ ($p < 0.05$). Biserial point correlation coefficient was 0.643 with $p < 0.001$.*

Conclusion: *There was a strong relationship between GERD-Q score and reflux oesophagitis. The higher the GERD-Q score, the higher the possibility to suffer from reflux oesophagitis.*

Keywords: *gastroesophageal reflux disease (GERD), GERD-Q, reflux oesophagitis, endoscopy*

ABSTRAK

Latar belakang: *Gastroesophageal reflux disease merupakan penyakit dengan gejala yang heterogen dan tidak ada pemeriksaan standar baku yang dapat dilakukan. Kuesioner adalah salah satu alat diagnostik yang memungkinkan penilaian gejala secara objektif. Kuesioner GERD-Q terdiri dari 6 komponen pertanyaan terdiri dari 4 sebagai komponen gejala refluks (prediktor positif GERD) dan 2 sebagai prediktor negatif terjadinya GERD. Penelitian ini bertujuan untuk melihat adanya hubungan antara skor GERD-Q dan esofagitis refluks pada pasien terduga GERD.*

Metode: *Penelitian ini merupakan penelitian analitik potong lintang, berlangsung dari bulan Maret sampai Juli 2019. Peserta penelitian adalah pasien yang datang ke unit endoskopi RS Hasan Sadikin, RSUD Cibabat dan RSU Al Islam, kemudian dievaluasi dengan menggunakan GERD-Q lalu menjalani pemeriksaan endoskopi. Tingkat keparahan esofagitis refluks yang diamati melalui endoskopi dinilai dengan klasifikasi Los Angeles. Pembacaan endoskopi dilakukan oleh satu orang dokter terlatih.*

Hasil: *Sebanyak 36 pasien diperiksa, 17 (47,2%) pasien menderita esofagitis refluks, termasuk 13 kasus dengan grade A (76,5%) dan 4 kasus dengan grade B (23,5%). Tidak ada kasus dengan grade C atau grade D. Pasien yang mengalami esofagitis refluks pada skor GERD-Q ≥ 8 sebanyak 15 orang (65,2%) dan pada skor GERD-Q < 8 sebanyak 2 orang (15,4%). Analisis Chi Square Test pada derajat kepercayaan 95% didapatkan nilai p = 0,004 (p < 0,005). Koefisien korelasi point biserial sebesar 0,643 dengan p < 0,001.*

Simpulan: *Terdapat hubungan yang kuat antara skor GERD-Q dan esofagitis refluks. Semakin tinggi skor GERD-Q, semakin besar kemungkinan mengalami esofagitis refluks.*

Kata kunci: *gastroesophageal reflux disease (GERD), GERD-Q, esofagitis refluks, endoskopi*

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a common gastrointestinal problem worldwide. Gastroesophageal reflux disease is defined as a recurrent disorder of gastric content reflux to the oesophagus, which cause the occurrence of characteristic symptoms (heartburn and/or regurgitation) and/or unpleasant complications.[1-3] The prevalence of GERD and its complications in Asia, including Indonesia, overall is lower compared to Western Countries, but recent data showed that the prevalence increases from year to year. The difference in race and geography is one of the important factors which determine the prevalence of GERD, as the environmental and genetic factors which influence the aetiology also differ.[1,3]

The high prevalence of GERD in the general population causes a significant utilization of health care resources.[1,4,5] Gastroesophageal reflux disease is a risk factor for oesophageal ulcer, stricture, Barrett oesophagus (BE) and oesophageal cancer; thus, diagnosis and early treatment is really required.[3,6,7] Diagnosis of GERD is difficult to establish and the assessment of symptoms or even invasive examinations have several weakness. In general, combination of several diagnostic tools (questionnaire, endoscopy, and others) is used to establish the diagnosis. Endoscopy is the gold standard examination towards reflux oesophagitis and Los Angeles (LA) classification is the commonly used classification method in evaluating the severity of oesophageal mucosal destruction.[1,8,9] Current international guideline recommends establishing diagnosis and determination of therapy based on symptoms (symptom-based diagnosis and therapy), except in the presence of alarming symptoms, such as dysphagia, weight loss or bleeding which require urgent endoscopy examination.[7,8] The increasing frequency of severe GERD symptoms (symptoms which appear everyday and disturb daily activities) was positively correlated with the occurrence of oesophagitis compared with atypical GERD symptoms.[10]

Gastroesophageal reflux disease questionnaire (GERD-Q) is a newly developed questionnaire as an instrument to increase and standardize the diagnosis and evaluate the treatment response in GERD patients.[11-13] Gastroesophageal reflux disease questionnaire consists of 6 questions, divided into two groups, which are: group one consists of 4 positive predictors of GERD (heartburn, regurgitation, sleeping disturbance due to reflux symptoms, and the use of over the counter drugs as addition apart from the prescribed medicines) and group 2 consists of 2 negative predictors of GERD (nausea and epigastric pain).[25,26] The cut-off value of GERD-Q score ≥ 8 give sensitivity and specificity of 65% and 71%, similar to the results obtained by gastroenterologists.[1,8,12,16,17] This study aimed to observe

the relationship between GERD-Q score and reflux oesophagitis in GERD suspected patients in Bandung.

METHOD

This study was an analytic study with cross-sectional design. This study used univariate analysis to describe general characteristics and numerical data, and later, used Shapiro-Wilk test to assess the distribution of the data; if the data is normally distributed, mean and standard deviation was calculated, otherwise normal, median and minimum-maximum value were calculated; for categorical data, proportion was calculated. Biserial point chi square correlation test was used to identify the relationship between GERD-Q score and reflux oesophagitis. Data analysis was performed using statistical product and service solution (SPSS) software for Windows version 18.0 with 95% confidence interval and a p value of ≤ 0.05.

Patients aged 18 years or more with GERD characteristic symptoms (heartburn and or regurgitation) who came to the Endoscopy unit were included to this study. Subject with alarm symptoms (undesired weight loss > 3kg in the last 3 months, persistent vomiting, dysphagia, active gastrointestinal bleeding, and intra-abdominal mass) were excluded. All subjects were given GERD questionnaire and their GERD-Q score was calculated. Later, endoscopy was performed by an experienced internist and the endoscopy results reading was performed by a gastroenterologist.

RESULTS

This study was performed in the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital, in March 2019 to July 2019. Subjects in this study were patients with characteristic symptoms of GERD (heartburn and regurgitation) who visited the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital and fulfilled the inclusion and exclusion criteria. Sample size was 36 subjects.

Subjects basic characteristics can be seen in Table 1 which showed that most patients with characteristic symptoms of GERD (heartburn and or regurgitation) without the presence of alarming symptoms and experienced reflux oesophagitis in the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital were in the age group of 36-50 years in 8 from 14 subjects (57.1%) and most of them were males with 7 from 13 subjects (53.8%).

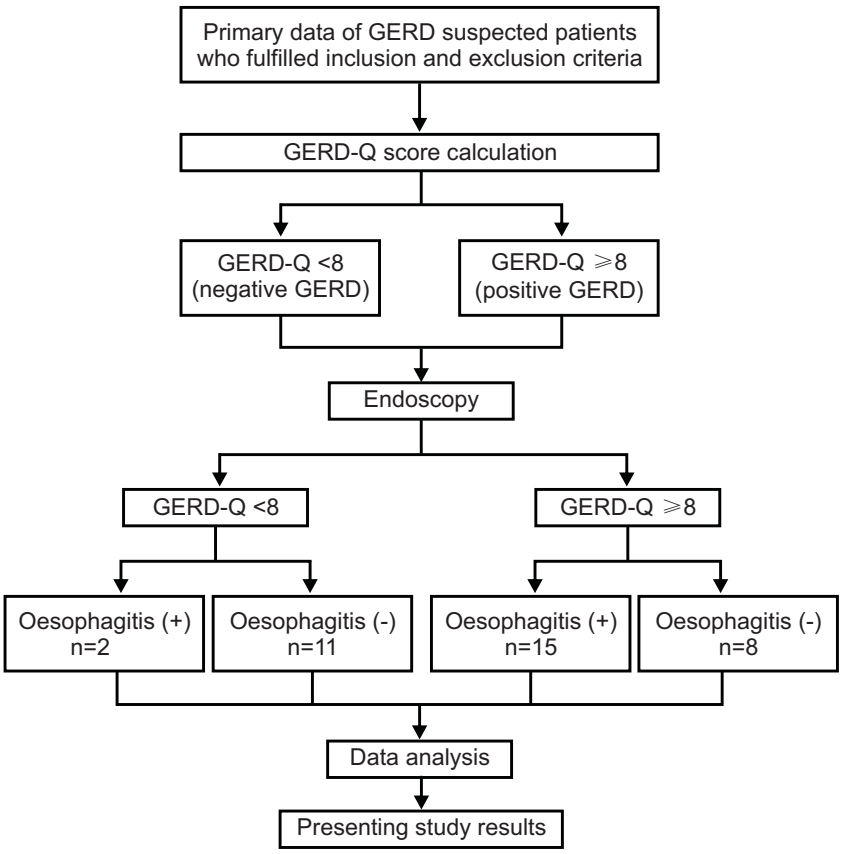

Figure 1. Study results flowchart

Table 1. Basic characteristics

Variables	Total n = 36 n (%)	Endoscopy	
		Erosive reflux disease/ERD, n = 17 (oesophagitis +) n (%)	Non-erosive reflux disease/NERD, n = 19 (oesophagitis -) n (%)
Age (years)	45.56 (12.47)		
21-35	10 (27.8)	4 (40.0)	6 (60.0)
36-50	14 (38.9)	8 (57.1)	6 (42.9)
>50	12 (33.3)	5 (41.7)	7 (58.3)
Sex			
Male	13 (36.1)	7 (53.8)	6 (46.2)
Female	23(63.9)	10 (43.5)	13 (56.5)
Education status			
Primary school	1 (2.8)	1 (100.0)	0 (0.0)
Junior high school/equivalent	2 (5.5)	2 (100.0)	0 (0.0)
Senior high school/equivalent	20 (55.6)	8 (40.0)	12 (60.0)
Diploma	4 (11.1)	3 (75.0)	1 (25.0)
University	9 (25.0)	3 (33.3)	6 (66.7)
Occupation			
Civil worker	8 (22.2)	6 (50.0)	6 (50.0)
Private	12 (33.3)	7 (46.7)	8 (53.3)
Housewife	15 (41.7)	3 (37.5)	5 (62.5)
Others	1 (2.8)	1 (100.0)	0 (0.0)
Body mass index/BMI (kg/m^2)	22.83 (13-56)		
<18,5	5 (13.9)	4 (80.0)	1 (20.0)
18,5-24,9	19 (52.8)	10 (52.6)	9 (47.4)
25-29,9	10 (27.8)	3 (30.0)	7 (70.0)
≥30	2 (5.6)	0 (0.0)	2 (100.0)

Table 2. Appearance of gastroesophageal reflux disease questionnaire (GERD-Q) score in patients with characteristic symptoms of GERD (heartburn and or regurgitation) without the presence of alarming symptoms

Variables	Endoscopic findings	
	Erosive reflux disease/ERD (oesophagitis +) n = 17	Non-erosive reflux disease/NERD (oesophagitis -) n = 19
GERD-Q Score ≥ 8 Mean (SD):	13 (1.94)	10 (1.68)
GERD-Q Score < 8 Mean (SD):	7 (0.70)	6 (1.47)

GERD-Q: relationship between gastroesophageal reflux disease questionnaire

In Table 1, it was observed that all patients with characteristic symptoms of GERD (heartburn and or regurgitation) and suffered from oesophagitis were educated up to primary school and junior high school with 100% in each group and most of them were self-employed with 6 from 12 people (50.0%). Table 1 also showed that most patients with characteristic symptoms of GERD (heartburn and or regurgitation) without the presence of alarming symptoms and suffered from oesophagitis has a body mass index < 18.5 kg/m^2 which were 4 from 5 subjects (80.0%).

Table 2 showed that the mean score of GERD in patients suffering from oesophagitis with the GERD-Q score ≥ 8 were 13 with a standard deviation of 1.94, median of 13 and minimum value of 8 and a maximum value of 15. Table 2 also showed that the mean score of GERD in patients suffering from oesophagitis with GERD-Q score < 8 were 7 with a standard deviation of 0.70, median of 6.5 and minimum value of 6 and a maximum value of 7.

Table 2.1 presented the mean GERD score in patients suffering from grade A oesophagitis with GERD-Q score ≥ 8 were 12 with a standard deviation of 1.89, median of 12 and a minimum value of 8 and a maximum value of 14 and grade B oesophagitis with GERD-Q score ≥ 8 had a mean score of 14 with a standard deviation of 1.5, median of 14 a minimum value of 12 and a maximum value of 15.

Table 2.1. Appearance of gastroesophageal reflux disease questionnaire (GERD-Q) score in patients with characteristic symptoms of GERD (heartburn and or regurgitation) with the presence of alarming symptoms

Variables	Endoscopic findings		
	Erosive reflux disease/ERD (oesophagitis +) Grade A n=13	Erosive reflux disease/ERD (oesophagitis +) Grade B n=4	Non-erosive reflux disease/ NERD (oesophagitis -) n=19
GERD-Q Score ≥8 Mean (SD):	12 (1.89)	14 (1.50)	
GERD-Q Score <8 Mean (SD):	7 (0.70)		

Table 2.1 also showed that the mean GERD score in patients who suffered from grade A oesophagitis with GERD-Q score < 8 were 7 with a standard deviation of 0.70, median of 6.5 and a minimum value of 6 and a maximum value of 7.

Table 3 revealed that the Chi-square test results with a confidence interval of 95% showed that statistically, there was a significant relationship between GERD-Q score and reflux oesophagitis in GERD suspected patients in Endoscopy Unit in Hasan Sadikin Hospital,

Cibabat District General Hospital, and Al Islam General Hospital with a p = 0.004 (p ≤ 0.05).

Table 3. Relationship between gastroesophageal reflux disease questionnaire (GERD-Q) score and reflux oesophagitis in GERD suspected patients

Variables	Endoscopic Findings		p*)
	erosive reflux disease/ERD (oesophagitis +) n	Non-erosive reflux disease/NERD (oesophagitis -) n	
GERD-Q Score			0.004
GERD-Q ≥ 8	15	8	
GERD-Q < 8	2	11	

From the analysis results in Table 3.1 above, it was found that the correlation coefficient was 0.643 with p < 0.001, meaning that there was a high correlation between GERD-Q score with incidence of oesophagitis; the higher the GERD-Q score, the higher the possibility of suffering from oesophagitis reflux.

Table 3.1 Relationship between gastroesophageal reflux disease questionnaire (GERD-Q) score with endoscopic findings (reflux oesophagitis) in GERD suspected patients without alarm symptoms

Variables	Endoscopy findings of oesophagitis erosive reflux disease (ERD)	
	r coefficient	p
GERD-Q score	0.643	< 0.001

Analysis was performed using point biserial correlation

DISCUSSION

The incidence rate of reflux oesophagitis (47.2%) in this study was increased compared to the previous study in Medan in the year 2015 by Gontar et al which were 40%, and the study by Syam et al in Jakarta, who reported the increasing incidence rate of reflux oesophagitis from 5.7% in year 1997 to 25.18% in year 2002.[1,18] The incidence rate of reflux oesophagitis in Indonesia tend to increase from year to year.[18,19,20]

Several studies reported that GERD is associated with daily lifestyle including age, alcohol consumption, smoking, and body mass index (BMI), but still observe contradictory study results.[21,22] The most common age group experiencing reflux oesophagitis was age group 36-50 years (57.1%) followed with age group > 50 years (41.7%). Study by Jea et al found that the mean age of those most commonly experiencing reflux oesophagitis was 42.5 with a standard deviation of 15.2 and Zou et al obtained a mean age of 49.5 with a standard deviation of 12.3.[23,24] The incidence of GERD increases with age, particularly in age more than 40 years.[19] Minatsuki et al, Yu Bai et al, and Ma XQ et al reported that there was a relationship between increasing age and incidence of reflux oesophagitis.[13,19,18,25] In this study, it was obtained that the age of patients with oesophagitis was older compared to those without oesophagitis. The influence of age in the incidence rate of GERD in the literature was stated as inconsistent.

Most studies reported that there was a difference in the incidence of GERD based on sex, but several studies found that male sex was a risk factor for oesophagitis (ERD), while female was the most frequent to experience NERD.[21,22] The less number of parietal cells in female was the reason of the lower risk of oesophagitis. In this study it was found that male sex was the most frequent to suffer reflux oesophagitis (53.85%) than female.

The relationship between body mass index (BMI) and GERD was still inconsistent. Previous studies showed significant relationship between the increasing BMI with the incidence of GERD.[21,22,26] In this study, it was found that the body mass index was not associated with GERD, in accordance with the study results from South Iran. One study conducted in Indonesia also showed that the most common characteristic of GERD patients was patients with normal BMI.[22] In this study patient suffering from reflux oesophagitis was most commonly found in the group with ideal body weight (18.5-24.9 kg/m^2) and underweight (< 18.5 kg/m^2), while in the obese group no reflux oesophagitis was observed. The difference of study results may be caused by the general characteristic of population and small sample size.

In this study, the group of patients suffering from reflux oesophagitis were mostly suffered from grade A with 76.5% and grade B with 23.5%. There was no reflux oesophagitis group who suffered from grade C or D. This study is in accordance with the study of Sijabat et al who reported that grade A oesophagitis was the most common occurrence.[1,18] Ma et al also reported that 96.9% patients in China who suffered from reflux oesophagitis were grade A or grade B.[4]

GERD-Q score ≥ 8 in this study with 23 subjects (63.9%) and the rest 13 subjects (36.1%) GERD-Q score < 8. In the group of GERD-Q score ≥ 8 who suffered from reflux oesophagitis were 2 subjects. The mean GERD-Q score in patients suffering from reflux oesophagitis were 13 in GERD-Q score ≥ 8 and 7 in the group of GERD-Q score < 8, while in patients who did not suffer from reflux oesophagitis were 10 in GERD-Q score ≥8 group and 6 in the GERD-Q score < 8 group. This study observed 2 subjects who suffered from reflux oesophagitis in GERD-Q score < 8 group. Previous study, Zhai et al, reported that the risk to suffer from reflux oesophagitis were relatively smaller

in GERD-Q score < 8 group and no patients suffered from reflux oesophagitis with GERD-Q score 0-2.[4,27] This showed that the lower the GERD-Q score, the lower the possibility to suffer from reflux oesophagitis. Higher GERD-Q score showed the higher possibility to suffer from reflux oesophagitis.[4,13,18,27] This study also showed that the mean GERD-Q score was higher in the group suffering from reflux oesophagitis either in GERD-Q score ≥8 or even in the GERD-Q score < 8 group. The higher the GERD-Q score, the higher the possibility of reflux oesophagitis.

In this study, assessment of the relationship between GERD-Q score and reflux oesophagitis was performed by chi square test. The results of chi square test in this study with a 95% confidence interval showed that statistically, there was a significant relationship between GERD-Q score and reflux oesophagitis in GERD suspected patients in the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital with a $p = 0.004$ ($p \leq 0.05$) and correlation coefficient of 0.643 with $p < 0.001$. In this study, to obtain the degree of relationship between GERD-Q score and reflux oesophagitis, point biserial correlation test was performed. After the measuring results were obtained, it was further translated using Guildford category (2006).[28] This study was in accordance with the study in China conducted by Man Wang et al with Spearman correlation analysis showed that there was a direct relationship between GERD-Q score and the severity degree of oesophagitis with a p of 0.233 ($p < 0.05$) and Yu Bai et al with a p of < 0.05.[4,13,]

This study has several limitations, which are: First, the small number of patients, and sample size is not appropriate with the classification based on GERD-Q score groups as the sampling method being used was consecutive sampling method; thus, there was a possibility that this will influence the power of the study. Second, in this study, the endoscopy instrument type being used in three study sites was different, which could affect the endoscopy results. In Cibabat General Hospital, endoscopy was performed using GIF Q150 type endoscopy (actera type). In Hasan Sadikin Hospital, the endoscopy procedure being used was GIF H190 and GIF H170 type endoscopy (exera III type with narrow-band imaging/NBI technique) with more sophisticated system in terms of resolution and image magnification being produced compared to GIF Q150 type endoscopy. In Al Islam Hospital, endoscopy was performed using GIF HQ190 type endoscopy (exera III type) with more sophisticated system in terms of resolution and image magnification being produced compared to the available endoscopy instrument in Hasan Sadikin Hospital because this instrument is equipped with double focus (near focus and normal focus) thus the image being produced is much better. Third, in this study, the endoscopy procedure was performed in three internists which has received endoscopy training and not gastroenterologists, which also may influence the power of the study.

CONCLUSION

This study concluded that there was a high and significant correlation between GERD-Q score and reflux oesophagitis with GERD suspected patients in the Endoscopy Unit in Hasan Sadikin Hospital, Cibabat District General Hospital, and Al Islam General Hospital.

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