

Association between Esophagitis Severity and GERDQ Score, Sleep, Life Quality among GERD Patients

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ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is characterized with acid reflux, therefore may lead to esophagitis. Acid reflux may cause night symptom of GERD, therefore resulting in decreased sleep and life quality. Gastroesophageal reflux disease questionnaire (GERDQ) is a simple and validated questionnaire for diagnosing GERD. This article aims to investigate association between esophagitis severity and GERDQ score, sleep, life quality among GERD patients at Prof. Dr. R.D. Kandou Hospital.

Method: An analytic-cross-sectional study was conducted in gastroenterology clinic of Prof. Dr. R.D. Kandou Hospital between May–June 2021. We included all patients with reflux esophagitis that proven by esophagoduodenoscopy and the severity was graded using Los-Angeles criteria. The GERDQ score was calculated in all patients. The analysis of sleep and life quality was assessed using validated Indonesian version of Pittsburgh-Sleep-Quality-Index (PSQI) and WHO-quality-of-life-BREF (WHOQOLBREF) questionnaire. Independent T-test was used to compare GERDQ, PSQI, WHOQOLBREF score with esophagitis severity degree.

Results: Among 30 patients with esophagitis, 70% was male. We found 22 patients with Los-Angeles-grade-A and 8 patients with Los-Angeles-grade-B. The analysis showed no significant different between GERDQ score with esophagitis grade ($p = 0.753$). There was no association between esophagitis grade with sleep quality ($p = 0.125$), physical health ($p = 0.161$), psychological health ($p = 0.728$), and environmental health ($p = 0.133$). But we found significant association between esophagitis grade with social relationship life quality ($p = 0.028$).

Conclusion: Patients with higher esophagitis degree had lower social relationship, but not associated with another domain of WHOQOLBREF, sleep quality, and GERDQ score.

Keywords: esophagitis, gastroesophageal reflux disease, sleep quality, quality of life

ABSTRAK

Latar belakang: Penyakit refluks gastroesofagus (GERD) berkaitan dengan refluks asam dan kejadian esophagitis. Refluks asam dapat mengakibatkan gejala GERD pada malam hari sehingga menurunkan kualitas tidur dan kualitas hidup. Gastroesophageal reflux disease questionnaire (GERDQ) merupakan suatu kuisisioner yang praktis dan tervalidasi untuk menegakkan diagnosis GERD secara klinis. Artikel ini bertujuan untuk mengetahui hubungan antara derajat keparahan esophagitis dengan skor GERDQ, kualitas tidur, dan kualitas hidup pada pasien esofagitis di Rumah Sakit Prof. Dr. R.D. Kandou.

Metode: Studi potong lintang analitik dilakukan di klinik gastroenterologi Rumah Sakit Prof Dr. R.D. Kandou antara Mei–Juni 2021. Kami memasukkan semua pasien dengan refluks esofagitis yang dibuktikan dengan esofagoduodenoscopy dan ditentukan menggunakan kriteria Los-Angeles. Skor GERDQ dihitung pada semua pasien. Analisis kualitas tidur dan kualitas hidup dinilai menggunakan Pittsburgh-Sleep-Quality-Index (PSQI) versi Indonesia dan kuesioner WHO-quality-of-life-BREF (WHOQOLBREF). Uji T tidak berpasangan digunakan untuk membandingkan skor GERDQ, PSQI, WHOQOLBREF dengan derajat keparahan esofagitis.

Hasil: Dari 30 pasien dengan esofagitis, 70% adalah laki-laki. Kami menemukan 22 pasien Los-Angeles-grade-A dan 8 pasien Los-Angeles-grade-B. Analisis menunjukkan tidak ada perbedaan yang signifikan antara skor GERDQ dengan derajat esofagitis ($p = 0,753$). Tidak ada hubungan antara derajat esofagitis dengan kualitas tidur ($p = 0,125$), kesehatan fisik ($p = 0,161$), psikologis ($p = 0,728$), dan lingkungan ($p = 0,133$). Tetapi kami menemukan hubungan yang signifikan antara derajat esofagitis dengan kualitas hidup hubungan sosial ($p = 0,028$).

Simpulan: Pasien dengan derajat esofagitis yang lebih tinggi memiliki hubungan sosial yang lebih rendah, tetapi tidak berhubungan dengan domain lain dari skor kualitas hidup WHOQOLBREF, kualitas tidur, dan GERDQ.

Kata kunci: esofagitis, penyakit refluks gastroesofagus, kualitas tidur, kualitas hidup

INTRODUCTION

The incidence of gastroesophageal reflux disease (GERD) is high in the general population, it is estimated to affect up to 20% of the population worldwide.^{1,2} In Western countries, 10–40% of people suffer from GERD. Eastern countries appeared to have a lower incidence of GERD. However, over the past ten years, it has remarkably increased from 5% to 8.5%.³ In Indonesia, the prevalence of GERD was approximately 57.6%.⁴

Esophagitis is a condition in which the contents of the gastric and/or duodenum reflux into the esophagus, resulting in a variety of esophageal mucosal breaks, erosions, or ulcers. The morbidity of esophagitis is increasing all over the world and may severely affect patients' quality of life. Dent et al developed the gastroesophageal reflux disease questionnaire (GERDQ) in 2007. It is a six-item self-administered diagnostic questionnaire. It is primarily used to improve and standardize symptom-based diagnosis and treatment evaluation in GERD patients.⁵ In daily practice, GERDQ has been validated for diagnosing GERD clinically. GERDQ consists of six questions which are heartburn, regurgitation, abdominal pain, nausea, sleep disorders, and anti-acid medications usage. GERDQ has been proven as practical and easy to use method for GERD evaluation.⁶ The questionnaire can be completed in the clinic, is easy to use, does not require an invasive examination, is inexpensive, and has high rates of patient compliance.

GERDQ's diagnostic validity and dependability have been demonstrated. While, endoscopy was used as the gold standard for diagnosing reflux esophagitis, several studies have also assessed regarding the significant correlation between GERDQ score and GERD severity.^{5–7} Validation study by Simadibrata et al showing that GERDQ is valid and reliable for use in Indonesian GERD patients.⁸

Sleep disturbances, such as difficulties initiating sleep, maintaining sleep, and complaints of non-refreshing sleep, are an issue that has received remarkable attention due to its role in mental and physical health. Previous study has demonstrated how important sleep is for maintaining well-being; to the point where it has even been designated as an independent predictor for GERD, evidence has demonstrated a two-sided association between functional gastrointestinal complications and sleep disturbances, particularly poor sleep quality.^{9,10}

Study showed possibility of correlation between GERD night symptom with sleep disorder and lower quality of life.^{9–11} This study aims to assess association between esophagitis severity and GERDQ score, sleep quality, and life quality among endoscopically-proven-esophagitis patients.

METHOD

This was an analytic-cross-sectional study that was conducted in gastroenterology clinic of Prof. Dr. R.D. Kandou Hospital between May–June 2021. We

used consecutive sampling method until minimum sample size (30 samples) was achieved. We included all patients with reflux esophagitis that proven by esophagoduodenoscopy and the esophagitis severity was determined using Los-Angeles criteria. The GERDQ score was calculated in all patients. The analysis of sleep and life quality was assessed using validated Indonesian version of Pittsburgh sleep quality index (PSQI) and WHO-quality-of-life-BREF (WHOQOLBREF) questionnaire. Independent t-test was used to compare GERDQ, PSQI, WHOQOLBREF score with esophagitis severity degree. All data were processed using statistical program for social sciences (version 25: Armonk; NY: IBM Corp).

RESULTS

Between May and June 2021, a total of 30 patients with esophagitis in gastroenterology clinic of Prof. Dr. R.D. Kandou Hospital were enrolled in this study. We found 22 patients with Los-Angeles grade A and 8 patients with Los-Angeles grade B. Seventy percent of the patients were male. The mean age of participants was 38.40 ± 8.99 years old. The analysis showed no significant association between GERDQ score with esophagitis grade ($p = 0.753$). And there is no association between esophagitis grade with sleep quality ($p = 0.125$), physical health ($p = 0.161$), psychological health ($p = 0.728$), and environmental health ($p = 0.133$). But we found significant association between esophagitis grade with social relationship life quality ($p = 0.028$).

DISCUSSION

Gastroesophageal reflux disease is a common disease in daily practice. Inadequate treated GERD may lead to serious complications and significantly

affecting quality of life.¹² The gold standard to diagnose GERD is using esophagogastroduodenoscopy (EGD), however, not every healthcare facility have endoscopy unit. Therefore, many efforts were made to clinically diagnose GERD. Since esophagitis is a disease based on symptoms, the symptom-based questionnaire is getting more and more attention. The GERDQ scale is a straightforward, dependable, and efficient diagnostic tool with significant clinical utility.^{7,10}

In this study, we found that GERDQ score and esophagitis grade were not found to be significantly associated. This is not in line with a previous study by Wang et al which found that the use of the GERDQ score had a significant correlation with the severity of esophagitis.⁷ However, results similar to this study were obtained in a study conducted by Sharara et al, in which the accuracy of determining the severity of esophagitis did not have a correlation with the GERDQ score. While, GERDQ was regarded as validated GERD diagnostic tool, the mixed results regarding the use of the GERDQ score in assessing the severity of esophagitis hinder further usage for esophagitis severity assessment.¹³

We did not find significant relationship between sleep quality which assessed by PSQI score with esophagitis grade. Study by Vela et al, found that GERD was associated with poor sleep quality but not Barrett's esophagitis. They also found that obstructive sleep apnea is determinant of sleep quality in GERD patients.¹⁴ Night GERD symptom was shown to affect the sleep quality of the patient. PSQI was general questionnaire for assessing sleep quality, however, the questions in the PSQI may less specific to assess sleep disturbance symptoms related to GERD. Several factors such as environment, sleeping habits, and other psychological factors that do not correlate with GERD, are included in the PSQI assessment.¹⁵ Therefore, a specific questionnaire to assess GERD patient's sleep quality is needed.

Table 1. Comparison between variable according to esophagitis severity group

Variable	GERD (n = 30)	Esophagitis Severity		p value
		Esophagitis Grade A (n = 22)	Esophagitis Grade B (n = 8)	
Male, n (%)	20 (70)	14 (70)	6 (30)	
Age, mean \pm SD	38.40 ± 8.99	38.81 ± 10.05	37.25 ± 5.49	0.680
GERDQ score, mean \pm SD	10.43 ± 1.94	10.5 ± 2.02	10.25 ± 1.83	0.753
PSQI, mean \pm SD	5.93 ± 5.21	5.00 ± 4.73	6.5 ± 5.93	0.125
WHOQOLBREF, mean \pm SD				
Physical health	60.07 ± 7.19	61.18 ± 5.65	57.00 ± 10.18	0.161
Psychological health	63.60 ± 8.96	65.09 ± 4.91	59.50 ± 15.04	0.728
Social relationship	72.10 ± 8.12	74.14 ± 4.82	66.50 ± 12.42	0.028
Environmental health	71.57 ± 6.84	73.14 ± 4.17	67.25 ± 9.36	0.133

GERD: gastroesophageal reflux disease; GERDQ: gastroesophageal reflux disease questionnaire; PSQI: Pittsburgh sleep quality index; WHOQOLBREF: WHO-quality-of-life-BREF

We found no significant association between esophagitis grade and sleep quality domain of WHOQOLBREF. Fujiwara et al stated that nighttime reflux may cause sleep disturbances such as shorter sleep duration, sleep arousal, therefore lead to impaired sleep quality. The relationship between sleep quality and GERD can be described as bidirectional.¹⁶ Teiomuri et al found that GERD was correlated with poor sleep quality among medical students. They analyzed that GERD symptoms such as heartburn and regurgitation were associated with sleep quality impairment, and other comorbidity such as being overweight also contributed in impairing sleep quality.¹⁷ In our study, we did not analyze other comorbidities that may impair sleep quality in GERD patients.

Lee et al found that heartburn and regurgitation, which are the two characteristics of GERD symptoms, may have different impact of life quality. They suggested that GERD patients with predominant heartburn symptom may have lower general health and more impaired daily activities.¹⁸ We did not find significant association between physical activity and esophagitis grade in our study. This may be explained due to further analysis is needed regarding the assessment of GERD symptom and other comorbidity that may impair physical health.

In the psychological domain, outside matters related to culture, workplace, living environment, in theory can affect psychological distress in patients. However, in this study the results obtained with an insignificant relationship because GERD can be caused by several factors that have been collected. Factors in the psychological domain need to be related to other factors in a comprehensive manner to be able to assess the impact of GERD as a whole. Further assessment regarding stress, anxiety, and depression level of the patients was needed to make conclusion. Likewise with environmental health factors which are found to be uncorrelated, the same as in the psychological domain. Variability in levels and standards of environmental health factors makes the assessment less specific.^{19–21}

We found significant association between esophagitis grade and physical domain of WHOQOLBREF questionnaire. This finding is consistent with result from Gorczyca et al. They found that GERD which may consist of stress and reflux complaints may lead to emotional disorder and limiting the frequency of social contact.²¹ Therefore, it can be concluded that persistent symptoms of GERD may affect the social function of patient.

CONCLUSION

Esophagitis grade severity is associated with lower social function, but not associated with other domain of life quality, sleep quality, and GERDQ score. Development of Indonesian language version of GERD specific quality of life and sleep quality questionnaires are encouraged to analyze more clearly. GERD management should also be focused in improving patient's quality of life and sleep quality.

REFERENCES

1. Boulton KHA, Dettmar PW. A narrative review of the prevalence of gastroesophageal reflux disease (GERD). *Annals of Esophagus* 2022;5:7.
2. Delshad SD, Almario CV, Chey WD, Spiegel BMR. Prevalence of gastroesophageal reflux disease and proton pump inhibitor-refractory symptoms. *Gastroenterology* 2020;158:1250–61.
3. Xiao YL. Gastroesophageal reflux disease: when east meets west. *J Dig Dis* 2022;23:192–5.
4. Syam AF, Sobur CS, Hapsari FCP, Abdullah M, Makmun D. Prevalence and risk factors of GERD in Indonesian population-an internet based study. *Advanced Science Letters* 2017;23:6734–8.
5. Suzuki H, Matsuzaki J, Okada S, Hirata K, Fukuhara S, Hibi T. Validation of the GERDQ questionnaire for the management of gastro-oesophageal reflux disease in Japan. *United European Gastroenterol J* 2013;1:175–83.
6. Jonasson C, Wernersson B, Hoff DAL, Hatlebakk JG. Validation of the GERDQ questionnaire for the diagnosis of gastro-oesophageal reflux disease. *Aliment Pharmacol Ther* 2013;37:564–72.
7. Wang M, Zhang JZ, Kang XJ, Li L, Huang XL, Aihemaijiang K, et al. Relevance between GERDQ score and the severity of reflux esophagitis in Uyghur and Han Chinese. *Oncotarget* 2017;8:74371.
8. Simadibrata M, Rani A, Adi P, Djumhana A, Abdullah M. The gastro-esophageal reflux disease questionnaire using Indonesian language: a language validation survey. *Med J Indones* 2011;20:125–30.
9. Okuyama M, Takaishi O, Nakahara K, Iwakura N, Hasegawa T, Oyama M, et al. Associations among gastroesophageal reflux disease, psychological stress, and sleep disturbances in Japanese adults. *Scand J Gastroenterol* 2017;52:44–9.
10. Ballou S, Alhassan E, Hon E, Lembo C, Rangan V, Singh P, et al. Sleep disturbances are commonly reported among patients presenting to a gastroenterology clinic. *Dig Dis Sci* 2018;63:2983–91.
11. Kurin M, Shibli F, Kitayama Y, Kim Y, Fass R. Sorting out the relationship between gastroesophageal reflux disease and sleep. *Curr Gastroenterol Rep* 2021;23:1–10.
12. Clarrett DM. Gastroesophageal reflux disease (GERD). *Mo Med* 2018;115:214–8.
13. Sharara AI, Rustom LBO, Bou DH, Rimmani HH, Shayto RH, Minhem M, et al. Prevalence of gastroesophageal reflux and risk factors for erosive esophagitis in obese patients considered for bariatric surgery. *Dig Liver Dis* 2019;51:1375–9.

14. Vela MF, Kramer JR, Richardson PA, Dodge R, El-Serag HB. Poor sleep quality and obstructive sleep apnea in patients with GERD and Barrett's esophagus. *Neurogastroenterol Motil* 2014;26:346–52.
15. Rezaeo M, Khormali M, Akbarpour S, Sadeghniaat-Hagighi K, Shamsipour M. Sleep quality and its association with psychological distress and sleep hygiene: a cross sectional study among pre-clinical medical students. *Sleep Sci* 2018;11:274–80.
16. Fujiwara Y, Arakawa T, Fass R. Gastroesophageal reflux disease and sleep disturbances. *J Gastroenterol* 2012;47:760–9.
17. Teimouri A, Amra B. Association between sleep quality and gastroesophageal reflux in medical students. *Middle East J Dig Dis* 2021;13:139–44.
18. Lee SW, Lien HC, Lee TY, Yang SS, Yeh HJ, Chang CS. Heartburn and regurgitation have different impacts on life quality of patients with gastroesophageal reflux disease. *World J Gastroenterol* 2014;20:12277–82.
19. Lee SW, Lee TY, Lien HC, Peng YC, Yeh HJ, Chang CS. Correlation between symptom severity and health-related life quality of a population with gastroesophageal reflux disease. *Gastroenterology Res* 2017;10:78.
20. Lippmann QK, Crockett SD, Dellon ES, Shaheen NJ. Quality of life in GERD and Barrett's esophagus is related to gender and manifestation of disease. *Am J Gastroenterol* 2009;104:2695–703.
21. Gorzyca R, Pardak P, Pekala A, Filip R. Impact of gastroesophageal reflux disease on the quality of life of Polish patients. *World J Clin Cases* 2019;7:1421–9.