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Reflux Symptom Index And Reflux Finding Score Correlation With Quality Of Life Of Laryngopharyngeal Reflux Patients

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ABSTRACT

Introduction. Laryngopharyngeal reflux (LPR) usually occurs due to the effects of reflux on the gloves and vocal cords. Symptoms range from more common symptoms such as hoarseness, globus sensations, and a feeling of getting stuck in the throat to less common symptoms such as heartburn and regurgitation. Symptoms common to LPR are not specific and may be related to other diseases. In other words, it is difficult to diagnose LPR based solely on symptoms. Belafsky et al in 2001 and 2002 developed the Reflux Symptom Index (RSI) and Reflux Finding Score (RFS) to assist in the diagnosis of LPR. Health-related quality of life Health-Related Quality of Life (HRQOL) in LPR patients have a negative impact on psychological status, social functioning, and quality of life. Symptoms of reflux appear to be a major contributor to the decline in quality of life. LPR patients have a significant impact on the mental component of their HRQO. **Methods.** Descriptive research with a correlation test design, conducted at RSUP Dr. Mohammad Hoesin Palembang on 22 samples of LPR patients who were treated at ENTKL polyclinics, IGD, or consulted from other departments in July-August 2022. **Results.** The majority of the study were women (81.85%) with dominant in the age group of 31-45 years (45.5%) with an average age of 42.23±11.88 years and a range of 19-66 years. There is a strong correlation between RSI and RFS with quality of life (r = 0.615; p = 0.016, r = 0.635; p = 0.028, respectively). **Conclusion.** RSI and RFS are significantly related to the quality of life of the sample so the treatment is recommended to also focus on the LPR only but also the mental health aspects.

1. Introduction

Laryngopharyngeal reflux disease (LPR) is an inflammatory condition of the upper aerodigestive tract associated with direct and indirect effects of reflux of gastric or duodenal contents, which induces morphological changes in the upper aerodigestive tract and refers to the backflow of gastric contents into the larynx.[1,2,3] The prevalence of LPR disease is 18.4% regardless of gender, with a prevalence of 19.1% in men and 17.7% in women. Several prior studies estimated the prevalence of LPR to be 34.4% in the United Kingdom, 18.8% in Greece, and 5.0% in Fuzhou region of China.[4–6]

LPR symptoms are nonspecific and can be caused by other disorders. In other words, it is challenging to identify LPR based solely on symptoms. In order to diagnose LPR objectively, in 2001 and 2002, Belafsky et al. develop the Reflux Symptom Index (RSI) and Reflux Finding Score (RFS) to diagnose LPR. RSI accurately tracks the improvement of nine reflux symptoms on a range from 0 to 5, while RFS assesses the clinical severity of LPR based on fiber-optic laryngoscopy findings.[7,8]

Patients with LPR present with laryngeal symptoms such as hoarseness, globus sensation, feeling trapped in the throat, and persistent cough, which respond more slowly to treatment than esophageal symptoms due to their chronic intermittent nature, requiring a longer treatment duration. As a result, patients with LPR had a big impact on their mental health quality of life (HRQOL).[8,9,10]

Various generic and disease-specific measures, such as the HRQOL laryngopharyngeal reflux (HRQOL-LPR) questionnaire, have been used to assess HRQOL. Carrau et al. (2005) reported that the HRQOL-LPR questionnaire demonstrates good reliability, validity, and responsiveness, as well as being simple and not burdensome to manage, assess, and analyze so it may be used to assist physicians and patients in comprehending the quality of life and the effect of therapy in LPR patients.[11] The goal of this study is to examine the correlation between the Reflux Symptom Index (RSI) and Reflux Finding Score

(RFS) and quality of life, as measured by the HRQOL-LPR questionnaire, in LPR patients treated at RSUP Dr. Mohammad Hoesin Palembang.

2. Methods

This descriptive study examines the RSI and RFS values and their correlations with HRQOL-LPR quality of life at RSUP Dr. Mohammad Hoesin Palembang in July-August 2022. The research sample consisted of all patients diagnosed with LPR based on the Reflux Symptom Index (RSI ≥13) and Reflux Finding Score (RFS ≥7) who were over the age of 18 and able to communicate well, who visited the HEENT department of RSMH Palembang, and who were willing to participate in this study. Patients with LPR who had nodules, masses, or paralysis of the vocal cords on laryngoscopy, pregnant women, and those with degenerative disorders (such as heart disease and cancer) were excluded from this study. An ethical approval was obtained from the Ethical Review Committee of the Sriwijaya University Faculty of Medicine (Approval Number: 108/kepkrsmh/2022)

The samples were collected through consecutive sampling. Based on the sample size calculation, the minimum number of samples was 20. The sociodemographic information of the research sample was acquired. Patients who met RFS and RSI inclusion criteria had an anamnesis, a physical examination, and an indirect laryngoscopy. The patient's quality of life was measured using the HRQOL-LPR questionnaire.

A univariate analysis was performed to establish the value of each subject's basic characteristics. For the normally distributed data, the Pearson Correlation Test is used for the bivariate analysis of the correlation between RSI and RFS to QOL, whereas Spearman Rho's test is used for non-normally distributed data. All data were analyzed using IBM® SPSS® Statistics version 26.0.

3. Results

This study recruited 22 participants diagnosed with LPR. The majority of LPR patients were between the ages of 31 and 45 (10 samples; 45.5%) with an average age of 42.23±11.88 years and a rage of 19 to 66 years. Females were more prevalent, with 18 samples (81.8%) being female. The majority of LPR patients had a normal BMI (13 samples; 59,1%). The disease onset of 1-6 months was found to be the earliest (18.2%), followed by 7-12 months in 8 samples (36.4%), with a mean onset of 55.05±61.58 days and a range of 2 to 261 days (Table 1).

In this study, the average RSI score for LPR patients was 19.14±4.30, with a value range of 13–28, based on physical examination-observed symptoms. There were higher rates of hoarseness, throat clearing, and excess mucus in 13 (59.1%), 21 (95.5%), and 15 (68.2%) samples, respectively. Each of the 17 samples (77.3%) revealed difficulty swallowing and coughing following a meal. In 13 (59.1%), 16 (72.7%), 19 (86.4%), and 16 (72.7%) samples, respectively, we detected symptoms of difficulty breathing, an irritating cough, lumpy feeling in the throat, as well as heartburn, chest pain, or GIT disturbances. Table 2 outlines the characteristics of RSI symptoms in LPR patients.

Table 1. Sociodemographic Characteristics Of Research Participants

Variables	n (%)	Mean±SD	Min-Max
Age		42.23±11.88	19–66
18-30 years	3 (13.6%)		
31-45 years	10 (45.5%)		
46-60 years	7 (31.8%)		
61-75 years	2 (9.1%)		
Sex			
Male	4 (18.2%)		
Female	18 (81.8%)		
BMI			
Normal	13 (59.1%)		
Overweight	4 (18.2%)		
Obesity	5 (22.7%)		
Onset (weeks)		55.05±61.58	2–261
<1 month	5 (22.7%)		
1-6 month(s)	4 (18.2%)		
7-12 months	8 (36.4%)		
>1 years	5 (22.7%)		

Table 2. Reflux Symptom Index (RSI) Of Research Participants

Reflux Symptom Index (RSI)	n (%)	Mean±SD	Min-Max
RSI		19.14±4.30	13–28
>13	22 (100%)		
Hoarseness			
Yes	13 (59.1%)		
No	9 (40.9%)		
Throat clearing			
Yes	21 (95.5%)		
No	1 (4.5%)		
Excess mucus			
Yes	15 (68.2%)		
No	7 (31.8%)		
Difficulty swallowing			
Yes	17 (77.3%)		
No	5 (22.7%)		
Coughing following a meal			
Yes	17 (77.3%)		
No	5 (22.7%)		
Difficulty breathing			
Yes	13 (59.1%)		
No	9 (40.9%)		
Irritating cough			
Yes	16 (72.7%)		
No	6 (27.3%)		
Lumpy feeling in the throat			
Yes	19 (86.4%)		
No	3 (13.6%)		
***Heartburn*/chest pain/GIT disturbances**			
Yes	16 (72.7%)		
No	6 (27.3%)		

In the study, patients with LPR had an RFS value ranging from 7 to 15 with an average value of 11.82±1.99. In this study, the absence of subglottic edema and granula was notable in 14 and 17 samples (63.6% and 77.3%, respectively), while ventricular obliteration symptoms and vocal cord edema was notable in 16 and 21 samples (72.7% and 95.5%, respectively). Erythema, diffuse laryngeal edema, posterior commissure hypertrophy, and endolaryngeal viscous mucosa was notable in 22 (100%), 20 (90.9%), 19 (86.4%), and 17 (77.3%) samples, respectively. Table 3 shows the characteristics of RFS symptoms in LPR patients.

In this study, the mean value and range of scores based on voice complaints were 6.45±2.48 with a range of 1–9 and a mean value of 7.00 when assessing the quality of life of patients with LPR. In the evaluation of quality of life based on cough complaints, the mean value was 5.68±1.98, the range was 1–9, and the median was 5.50. The mean score for throat clearing complaints was 5.82±2.70, with a range of 1–9 and a median value of 6.0. On the basis of swallowing complaints, a mean value 7.18±2.10 with a range of 4–10 and a median value of 6.5 was determined. The social conditions-based evaluation of quality of life yields a mean value of 74.86±19.9, a range of 35–99, and a median value of 78.0. Table 4 displays the quality of life of the patients in this study.

In this study, there was a strong and significant positive correlation between RSI scores and quality of life ($r = 0.615$; $p = 0.016$). Furthermore, there was a strong and significant positive correlation between RFS score and quality of life ($r = 0.635$; $p = 0.028$). Table 5 displays the correlation between RSI and RFS scores and quality of life as measured by the HRQOL-LPR questionnaire in LPR patients.

Table 3. Reflux Finding Score (RFS) Of Research Participants

Reflux Finding Score (RFS)	n (%)	Mean±SD	Min-Maks
RFS		11.82±1.99	7-15
>7	22 (100%)		
Subglottic edema			
Yes	8 (36.4%)		
No	14 (63.6%)		
Ventricular Obliteration			
Yes	16 (72.7%)		
No	14 (63.6%)		
Vocal cord edema			
Yes	21 (95.5%)		
No	1 (4.5%)		
Erythema / hyperemia			
Yes	22 (100%)		
No	0 (0%)		
Diffuse laryngeal edema			
Yes	20 (90.9%)		
No	2 (9.1%)		
Posterior commissure hypertrophy			
Yes	19 (86.4%)		
No	3 (13.6%)		
Granula			
Yes	5 (22.7%)		
No	17 (77.3%)		
Endolaryngeal viscous mucosa			
Yes	17 (77.3%)		
No	5 (22.7%)		

Table 4. Characteristics Of Quality Of Life Of Research Participants

Characteristics of QOL	Mean ± SD	(Min- Max)
Based on voice complaints	6.45 ± 2.48	(1–9)
Based on cough complaints	5.68 ± 1.99	(1–9)
Based on throat clearing complaints	5.82±2.70	(1–9)
Based on swallowing complaints	7.18±2.10	(4–10)
Based on social conditions	74.86±19.9	(35–99)

Table 5. Correlation Of RSI And RFS Score To Quality Of Life

		R	p
RSI	**HRQOL-LPR**	0.615	0.016
RFS		0.635	0.028

4. Discussion

This study examines the correlation between RSI and RFS and LPR patients' quality of life. In this study, the average age of patients with LPR was 42.23±11.88 years, compared to 41.28±11.88 years and 43±11.25 years in earlier research. This shows that work stress cannot be ruled out as a cause of LPR, given that the typical age of LPR patients is between 40 and 50 years old, which is the productive age of a person.[12,13] In addition, the female gender was more prevalent in this study, consistent with previous research suggesting that this sex-related difference in susceptibility to LPR could be explained by anatomical differences. The shorter and thinner vocal cords of females may be more easily completely impaired by gastric contents.[13,14]

In addition to hydrochloric acid, enzymes (particularly pepsin), food waste, bile acids, and microorganisms are also present in gastric reflux. Reflux episodes may involve large amounts of fluid, particularly in the lower esophagus, whereas laryngopharyngeal reflux may be gaseous and contain small aerosol droplets. This event can be initiated by the lower section of the esophagus when the sphincter relaxes. Once the aerosol enters the laryngopharynx, it can reach the nose, nasopharynx, and lower respiratory tract with

relative ease.[15]

The Reflux Symptom Index (RSI) was created by Belafsky et al. to assist doctors in assessing the severity of LPR symptoms during the first examination and following treatment. The RSI is the only accessible instrument for subjectively evaluating the severity of LPR. The RSI is a validated and multilingual nine-item self-administered questionnaire. An RSI score of more than 13 is deemed abnormal. In this study, the RSI value was greater than 13 in all 22 samples, with a mean of 19.14±4.30 and a range of 13−28. In 2020, Bozzani et al. conducted research in Korea and discovered an average RSI score of 22.1±6.2. Tamin et al. also discovered that 22 (88%) of the 32 patients with sleep apnea exhibited LPR.[7,16,17]

In a single cohort study conducted by Wang et al. in 2019, 83 LPR patients had an average RSI value of 19.22±5.18. According to the study, the nine symptoms of LPR, such as difficulty swallowing, coughing after eating or when lying down, chest feeling like it is burning, difficulty digesting food, feeling pain in the chest, excess mucus, throat clearing, and changes in voice, can cause a decrease in quality of life due to discomfort caused by increased stomach acid.[18]

The RSI questionnaire is patient-dependent. The RSI lacks assessment of frequent symptoms such as sore throat, odynophagia, halitosis, and regurgitation, in addition to the frequency of symptoms. The diagnosis of LPR was determined to require a high mean RSI score; nevertheless, the RSI score reflects laryngeal irritation and is not exclusive to LPR. Nonetheless, RSI can be used to diagnose LPR, particularly in healthcare settings that lack endoscopic equipment, and is a valuable tool for determining the efficacy of therapy.[19,20]

The results of this study demonstrated a strong and statistically significant correlation between RSI scores and quality of life (r=0.61; p=0.016). The finding fits with what Printza et al. found in their study in 2022, which showed that the higher the RSI score, the worse the quality of life.[20] In addition, the study conducted by Hill et al. indicated a moderate and significant correlation (r=0.53, p<0.05) between LPR-RSI and GERD-HRQL and identified that women with LPR had a significant association with poor quality of life. Hill et al. concluded that it is necessary to examine psychoemotional factors for gastroesophageal reflux and LPR because the symptoms of LPR based on RSI are distressing and cause discomfort, thereby increasing the symptoms of stress, depression, and anxiety in patients, particularly those who have suffered from chronic esophagitis.[21]

In this study, the correlation between RFS scores and quality of life was strong and statistically significant (r=0.63; p=0.028). The prior study conducted by Lechien et al. observed a correlation between a high RFS score and decreased quality of life. In addition, according to a 2017 study by Gong et al., the HRQOL of patients with GERD and LPR symptoms was lower than that of patients without LPR (0.88 vs 0.91, p=0.002), and the severity of LPR symptoms was associated with a decrease in HRQOL.[1,22]

LPR has detrimental effects on psychological status, social functioning, and quality of life. It appears that reflux symptoms were the major contributor to decreased quality of life. The study by Carrau et al. indicated that LPR had a detrimental influence on all quality-of-life dimensions. In seven of the eight HRQOL domains, the HRQOL of LPR patients was considerably lower than that of the general population. Only the scores on the "role and emotional restrictions" scale were not statistically significant (p=0.225), while the most pronounced disparities between patients with LPR and general populations were found in the categories of social functioning (67.1 vs. 83.3; p=0.001) and bodily discomfort (60.9 vs. 75.2; p=0.001).[9,10] Consistent with this research, an experimental study by Chandran et al. on samples with GERD assessed by RFS-LPR found a significant association between quality of life and LPR-RFS (p<0.05) and concluded that depressive symptoms can exacerbate GERD with LPR and affect the quality of life, so the treatment of patients with LPR should also emphasize psychological factors.[23]

The limitations of this study lie in the relatively small sample size. On the other hand, this study has the advantage of collecting primary data directly from patients, which allows for a more comprehensive examination.

4. Conclusion

There is a strong and significant positive correlation between RSI values and quality of life (r=0.61; p=0.016), as well as a strong and significant positive correlation between RFS values and quality of life (r=0.63; p=0.028) in LPR patients.

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