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2 DESCRIPTION OF LARYNGOPHARYNGEAL REFLUX PATIENTS BASED ON REFLUX SYMPTOM INDEX (RSI) AFTER PPI ADMINISTRATION AT UKI GENERAL HOSPITAL

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2 ABSTRACT

Reflux is a backflow; this word is taken from the Latin "re", which means to return or return, and "fluere", which means to flow. Laryngopharyngeal reflux (LPR) is the retrograde movement of stomach acid into the pharynx, larynx, and upper digestive tract. LPR can also cause irritation and changes in the larynx. The prevalence rate of LPR ranges from 5 to 30% in the world. It is relatively low for Asia itself, namely 3-5%. The RSI has nine reflux symptoms that can determine the presence of LPR symptoms and the degree before and after therapy. This research is descriptive analysis research with data collection using the RSI questionnaire as a research instrument. From the results of this study, it was found that the description of laryngopharyngeal reflux patients based on RSI after PPI administration at UKI General Hospital showed that the most symptoms were based on the primary complaint, namely heartburn, while difficulty breathing, annoying cough, and a feeling of lump were not found to be the main complaints. 18 LPR patients came for treatment at the ENT-KL clinic at UKI Hospital. Women are the most common gender. The majority of the patients who came were 21 years old. Assisting medical personnel in filling out questionnaires and improving patient medication adherence

2 KEYWORDS: LPR, PPI, RSU UKI.

INTRODUCTION

Reflux is a backflow; this word is taken from the Latin "re", which means to return or return, and "fluere", which means to flow. Laryngopharyngeal reflux (LPR) is the retrograde movement of stomach acid into the pharynx, larynx, and upper digestive tract. LPR can also cause irritation and changes in the larynx.^[1] The term laryngopharyngeal reflux was first published by Otolaryngology magazine in 1968 by Cherry and Marguilles cited by Alberto (2008), who found ulceration and granulation tissue in the larynx due to exposure to gastric acid.^[2]

LPR prevalence is 15-20%, and >15% of these patients go to an ENT specialist with manifestations of complaints from LPR patients who impact the decreasing quality of life.^[3] From the research conducted by Kaufman Wiener, Wu, and Catell, 4-10% of patients with ENT complaints have LPR. A cohort study conducted on 100 patients without a history of voice disturbances or voice disturbances in the larynx found about 35% who had symptoms of LPR and 64% showed one or more clinical features of LPR on laryngoscopy examination.^[4]

The prevalence of LPR is challenging to estimate in the general population because of the unavailability of an

easy and generally accepted diagnostic method for large-scale epidemiological studies.^[5] LPR Episodes have been reported by 30-50% of normal controls, the LPR prevalence in the general population varies from 7.1% to 64%. The prevalence rate of LPR ranges from 5 to 30%.^[6] It is reported to be relatively low for Asia itself, namely 3-5%. Of patients who came to a head and neck surgery outpatient unit of Dr Soetomo Surabaya, 64.29% were women, and 35.71% were men.^[7] For Dr. M Djamil Hospital Padang, it was obtained from 30 respondents consisting of 23 women (76.7%) and seven men (23.3%). The highest age group was 48-57 years (40 %).^[8]

1 The diagnosis for LPR was made using the Reflux Symptom Index (RSI), Reflux Finding Score (RFS) based on findings on fiberoptic nasopharynx laryngoscopy, and percentage of time proximal acid exposure with dual-probe PH monitoring.^[9] LPR is a common disease, but because the symptoms are nonspecific and the laryngoscopic signs do not always correlate with the severity of the symptoms, making a diagnosis may be difficult. There are no typical signs and symptoms for LPR itself, but validated RSI and RFS can diagnose LPR. Ambulatory examination 24 hours double-probe pH metric is the gold standard for diagnosing LPR, but this examination is far from ideal. The latest research to detect LPR is by determining the

presence or absence of pepsin in the larynx by using the immunoassay method; Enzyme-Linked Immunosorbent Assay (ELISA).^[10] Treatment of LPR includes a combination of diet, behaviour modification, antacids, H2 receptor antagonists, proton pump inhibitors (PPIs) and surgery. Based on the description above, that data about the description of LPR patients in the ENT-KL in Indonesia, there are still shortcomings from previous researchers who have not done much, so researchers are interested in further researching how the description of LPR patients based on age, gender, clinical manifestations and treatment in ENT-KL Poly RSU UKI.

Based on the problem formulation above, the problem formulation in this study is how the LPR (Laryngopharyngeal Reflux) patient is described based on the reflux index scoring after PPI administration at UKI Hospital. With the aim of research to find out the description of LPR (Laryngopharyngeal Reflux) patients based on the reflux index scoring after PPI administration.

Literature Review

Laryngopharyngeal reflux (LPR) increases stomach acid to the larynx and pharynx that can reach the oral cavity and nasal cavity and cause inflammation of the mucosa in that area because the mucosa is thin and does not have sufficient protection against irritation from gastric acid.^[11] Laryngopharyngeal reflux can occur when there is a pressure difference between positive intra-abdominal pressure and negative pressure in the thorax and laryngopharynx. Physiological gastroesophageal reflux occurs predominantly because of the Transient Lower Esophageal Sphincter Relaxation (TLESR). TLESR can be stimulated by gastric distention, especially in the postprandial period and is activated by stretch receptors on the gastric wall.^[12]

The cause of LPR is retrograde reflux of gastric acid or contents such as pepsin in the upper oesophageal tract and causing mucosal injury due to direct trauma. It causes damage to the cilia, which can lead to accumulation of mucus, the activity of clearing the throat and chronic coughing, causing irritation and inflammation. The pathophysiology of LPR is still difficult to ascertain. It is well known that the mucosa of the pharynx and larynx is not designed to prevent direct injury from gastric acid and pepsin contained in reflux. The larynx is more susceptible to flux than the oesophagus because the larynx does not have the exact extrinsic and intrinsic defence mechanisms as the oesophagus.^[13]

In LPR, patients usually have nonspecific symptoms such as a lump in the throat (globus sensation), vocal fatigue, hoarseness, chronic cough, dry throat, sore throat and dysphagia.^[14] Other signs that LPR patients feel are snot dripping into the nasopharynx (post-nasal dripping) and much phlegm in the throat, but other symptoms that usually accompany it are asthma exacerbations, otalgia, halitosis. LPR patients have different symptoms, signs

and pathophysiology from GERD patients, but both conditions can co-occur. GERD itself can cause LPR to occur. GERD can be caused by dysfunction of the lower oesophageal sphincter, while LPR is usually caused by the upper oesophageal sphincter.^[15;16]

The symptoms and signs are different, but it is difficult to distinguish when the patient comes with complaints because both coincide. The difference seen in LPR patients is that they do not often complain of burning in the chest. Patients with LPR usually experience reflux in an upright position during the day, while those with GERD reflux at night in a reclining position.^[17] Diagnosis is usually made by using clinical symptoms (reflux symptoms index) and examining the larynx using a reflux finding score. Investigations are also often used to establish the diagnosis. The laryngoscopy findings used for the diagnosis of reflux are nonspecific signs of laryngeal irritation and inflammation. Examination of the larynx identified oedema and erythema, especially in the posterior region. Investigators used these findings to diagnose LPR.^[18]

In an attempt to identify the most specific laryngoscopy signs of LPR, Belafsky et al. developed the Reflux Finding Score (RFS) based on findings from fiberoptic laryngoscopy. This scale evaluates eight items of the most common laryngoscopy findings in patients with LPR: subglottic oedema; ventricular obliteration; erythema or hyperemia; oedema of the vocal cords; generalized laryngeal oedema; posterior commissure hypertrophy; granuloma or granulation tissue; and excess mucus in the larynx. Each item was scored according to severity, location, and presence or absence, for a total score of 26. Patients with a score of 7 or more were classified as having LPR. In that study, this scale demonstrated excellent reproducibility and, although individual items alone did not predict the presence or absence of LPR, the total RFS score was highly suggestive of LPR in patients with scores higher than 7. treatment in patients with LPR.^[19]

This method is capable of detecting both acidic and non-acidic liquids or gases.^[20] Despite the controversy, LPR events occurred when the proximal sensor pH dropped to <4 during or after distal acid exposure (near the lower oesophageal sphincter) and LPR was confirmed when the total acid exposure time (percentage time during 24-hour monitoring when the sensor detected a pH <4>1 % Multichannel intraluminal impedance-pH monitoring is helpful for the diagnosis of LPR, but the methods tested vary widely. There is no consensus on the definition of abnormal pH.^[21] PPIs are non-reversible benzimidazole substitution compounds that inhibit the proton pump of gastric parietal cells, namely H⁺/K⁺-ATPase. These drugs require the acidic environment of the parietal cell secretory canaliculus for activation, namely prodrugs. PPIs should be taken 30-40 minutes before breakfast and before dinner. The four proton pump inhibitors currently

available are omeprazole, Lansoprazole, rabeprazole and pantoprazole.

Lansoprazole, like other PPIs, binds to and inactivates the H⁺/K⁺ ATPase of gastric parietal cells, leading to inhibition of the proton pump that carries H⁺ into the gastric lumen, the final step in gastric acid production. After being absorbed into the systemic circulation, this drug will diffuse into the gastric parietal cells and collect in the secretory canaliculi, where it undergoes activity to convert to the tetracyclic sulfonamide form.^[22]

This active form will bind together with the sulfhydryl groups of enzymes H⁺, K⁺, ATPase, which are in the apical membrane of parietal cells. This bond will cause inhibition of the enzyme. Inhibition will last for about 24-48 hours and will reduce the secretion of gastric acid basal or due to stimulation, regardless of the type of stimulation histamine, acetylcholine or gastrin. This inhibition is irreversible because acid production can occur again after 3-4 days of discontinuing treatment.^[23] Proton inhibitors should be administered in enteric-coated preparations to prevent depletion of the active substance under acidic conditions. This preparation does not experience the action in the stomach to have better bioavailability. For lansoprazole bioavailability >80, half-life 1.0-2.0, time to peak plasma/serum drug levels is 1.7. Blum et al. compared Lansoprazole with omeprazole with oral preparations, found that Lansoprazole maintained a pH > 3 significantly and a 24 hour mean pH was better than omeprazole. It is not significant, caused by the length of therapy, diet and life modification. Kaufman et al. revealed that PPI therapy followed by a low-acid diet could significantly reduce RSI scores. Previous studies also found that there was resistance to the drug omeprazole in patients suffering from LPR, so it is recommended to use a high dose of 40 mg as the initial dose.^[24]

Belfasky stated that there are **the reflux symptoms (Reflux Symptom Index/RSI) that can be used to determine the presence of LPR symptoms and the degree before and after therapy.** The RSI score is 0-45, with a score of 13 suspicious for LPR. RSI is relatively simple. Doctors can examine it independently and will indicate whether or not to use other tests.^[25] RSI is the most frequently used measure to assess clinical outcomes, but it is not exhaustive and only considers some aspects of the symptoms and findings of LPR.

The reflux symptom index contains nine items, eight for pharyngolaryngeal and respiratory symptoms and 1 for digestive symptoms, symptoms without other complaints such as ear, nose, oral cavity, etc. In addition, the RSI considers the severity of symptoms but not their frequency. In Sri Endah et al.'s study of the difference in scores between omeprazole and Lansoprazole before therapy, a mean score of 18.70 for omeprazole was 23.71 lansoprazole. After getting therapy for three months, the RSI score of 11.39 for omeprazole and Lansoprazole was

15.04. Based on the RSI symptoms examination for the lansoprazole group, there was an improvement in RSI symptoms, while for the omeprazole group, there was an improvement in almost all symptoms except for coughing mucus in the throat and annoying cough.^[26]

Belafsky and Rees showed very significant results for pre-and post-therapy RSI examination for two months using omeprazole. DelGaudio stated that RLF patients treated with omeprazole 40 mg for eight weeks could improve 60-90%. From several studies recommending assessing the effectiveness of PPIs based on symptoms, giving PPIs for 2 to 3 months has provided significant improvement results. According to Park and Hicks, treatment response to PPIs in RLF patients varies from 60 to 98%. After two weeks and two months of therapy, there was a significant improvement in RFS scores in the lansoprazole group.^[27]

From several studies of patients who were given routine therapy with PPI lansoprazole 2x30 mg after one month of therapy, IGR and STR were assessed using the Wilcoxon sign rank test and the results after receiving therapy for one month. after therapy with a value of $z = 5.168$ and $p = 0.001$. The mean change in total STR was from 11.77 ± 2.94 to 6.09 ± 2.62 after therapy. There was a significant change between STR scores before and after therapy with a value of $z = 5.167$ with $p = 0.001$.^[28]

Research Method

This research is descriptive analysis research with data collection using the RSI questionnaire as **research instrument.** This research will be conducted **at the ENT-KL clinic at UKI Hospital.** This study was conducted in January-February 2021. The population in this study **w** all patients diagnosed with laryngopharyngeal reflux in **January-February 2021.** Sampling used purposive **accidental sampling** in which all patients with cases of laryngopharyngeal reflux in the period January-February 2021 as respondents used the RSI (Reflux Symptom Index). In the procedure of data collection and collection, this study carried out the following stages: a) the results of direct interviews with respondents based on the RSI questionnaire (reflux symptom index); b) give informed consent to research subjects to request permission to use subject data, and c) Medical records of patients diagnosed with Laryngopharyngeal Reflux. This research uses the Univariate Analysis method. Then the data will be processed using the SPSS (Statistical For Social Science) program and group the data using tables.

RESULT AND DISCUSSION

From table 1, it was found that the patients' gender is primarily women with a percentage of 61.1% and for men 38.9%. For the age table, the age is 21 years, with a value of 66.7%. The results obtained for the BMI value are that most patients have a normal BMI.

Table 1: Patient Characteristics.

Characteristics of Respondents		Frequency	%
Gender	Male	11	38,9
	Female	7	61,1
	Total	18	100
Age	20-21	14	77,8
	22-23	4	22,2
	Total	18	100
BMI	Underweight: < 18,5 kg/M ²	2	11,1%
	Normal :18,5 – 24,9 kg/M ²	11	61,1%
	Overweight: 25- 29,9 kg/M ²	4	22,2%
	Obese: ≥ 30.0 kg/M ²	1	5,6%
	Total	18	100%

The results in table 2 show that in this study, many patients complained of heartburn with a percentage value of 33.3%, followed by symptoms of a lump in the throat

22.2%, disturbing cough symptoms 16.6% and there were symptoms with the same preset value, namely voice hoarseness, frequent coughing, excessive mucus 11.1%.

Table 2: Overview of the main complaints of LPR patients at UKI General Hospital.

Clinical Symptoms	Frequency	%
Hoarseness/voice problem	1	11,1%
Frequently clearing/removing mucus from the throat	2	11,1%
Excessive mucus/post nasal drip (PND)	2	11,1%
Annoying cough	3	16,7%
A lump in the throat	4	22,2%
Heartburn, chest pain, indigestion, acid regurgitation	5	27,8%
Total	18	100%

Table 3 shows that eight patients experience hoarseness/voice problems with moderate complaints, complaints cannot be ignored, 1x in 1 week 44.4% followed by five patients with mild complaints, complaints can be ignored 1x in 1 month 27.8%, two patients who do not experience hoarseness/voice

problems 11.1% and two patients who have severe complaints, complaints affect lifestyle, several times in one week 11.1%, one patient has complaints Very severe, complaints significantly affect lifestyle, daily 5.6%.

Table 3: Hoarseness/Voice Problem.

	Frequency	%
No complaints	2	11,1
Light complaints can be ignored 1x in 1 month	5	27,8
Moderate complaints can not be ignored, 1x in 1 week	8	44,4
Heavy complaints affecting lifestyle, several times a week	4	11,1
Very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 4 shows that almost all patients have moderate complaints, with a total of 9 50.0% followed by three patients with mild complaints 16.7%, and three patients experiencing severe 16.7%, two patients do not

experience complaints of frequent coughing/discharge mucus in the throat 11.1%, one patient had very severe complaints 5.6%.

Table 4: Frequent Coughing / Clearing Throat Lenders.

	Frequency	%
No complaints	2	11,1
Light complaints can be ignored 1x in 1 month	3	16,7
Moderate complaints can not be ignored, 1x in 1 week	9	50,0
Heavy complaints affecting lifestyle, several times a week	4	16,7
Very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 5 shows patients with mild complaints, eight patients 44.4% followed by four patients with severe complaints 22.2% who experienced moderate complaints

there were three patients 16.7, 2 patients who did not experience symptoms of post-nasal drip 11.1%, and one patient who had very severe complaints.

Table 5. Excessive mucus/ Post Nasal Drip (PND).

	Frequency	%
No complaints	2	11,1
Light complaints can be ignored 1x in 1 month	8	44,4
Moderate complaints can not be ignored, 1x in 1 week	3	16,7
Heavy complaints affecting lifestyle, several times a week	4	22,2
Very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 6 shows 11 patients with mild complaints 61.1, followed by four patients with moderate complaints

22.2% and three patients who did not have difficulty swallowing.

Table 6: Difficulty Swallowing.

	Frequency	%
No complaints	3	16,7
Light complaints can be ignored 1x in 1 month	11	61,1
Moderate complaints can not be ignored, 1x in 1 week	4	22,2
Total	18	100

Table 7 shows that nine patients had mild complaints 50.0%, and nine patients had moderate complaints 50.0%.

Table 7: Cough after eating/lying down.

	Frequency	%
Light complaints can be ignored 1x in 1 month	9	50,0
Moderate complaints can not be ignored, 1x in 1 week	9	50,0
Total	18	100

Table 8 shows seven patients with moderate complaints 38.9% followed by four patients with mild complaints 22.2%, three patients having no complaints 16.7, 3 other

patients complaining of severe 16.7% and one patient with very severe complaints 5, 6%.

Table 8: Difficulty Breathing/Chocking.

	Frequency	%
No complaints	3	16,7
Light complaints can be ignored 1x in 1 month	4	22,2
Moderate complaints can not be ignored, 1x in 1 week	7	38,9
Heavy complaints affecting lifestyle, several times a week	4	16,7
Very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 9 shows the most complaints with eight patients, namely moderate 44.4%, followed by seven patients with moderate complaints 38.9%, two patients experiencing

very severe complaints 11.1% and one patient with mild complaints 5.6%.

Table 9: Annoying Cough.

	Frequency	%
Light complaints can be ignored 1x in 1 month	1	5,6
Moderate complaints can not be ignored, 1x in 1 week	8	44,4
Heavy complaints affecting lifestyle, several times a week	7	38,9
Very heavy, complaints significantly affect lifestyle, every day	2	11,1
Total	18	100

Table 10 shows six patients with moderate complaints 33.3%, five patients complaining of mild 27.8%, four patients with severe complaints 22.2%, two patients with

very severe complaints 11.1% and one patient with no complaints, 5,6%.

Table 10: A lump in the throat.

	Frequency	%
No complaints	1	5,6
Light complaints can be ignored 1x in 1 month	5	27,8
Moderate complaints can not be ignored, 1x in 1 week	6	33,3
Heavy complaints affecting lifestyle, several times a week	4	22,2
Very heavy, complaints significantly affect lifestyle, every day	2	11,1
Total	18	100

Table 11: Heartburn, Chest Pain, Indigestion, Acid Regurgitation.

	Frequency	%
No complaints	1	5,6
Light complaints can be ignored 1x in 1 month	2	11,1
Moderate complaints can not be ignored, 1x in 1 week	5	27,8
Heavy complaints affecting lifestyle, several times a week	6	33,3
Very heavy, complaints significantly affect lifestyle, every day	4	16,7
Complaints that are very heavy and persist throughout the day	1	5,6
Total	18	100

Table 11 shows that six patients with severe complaints 33.3% followed by moderate complaints with a total of 5 patients 27.8%, very severe complaints with a total of 3

patients 16.7%, two patients with mild complaints 11.1%, one patient with very severe complaints 5.6% and one patient no complaints 5.6%.

Table 12: Hoarseness/Voice Problem.

	Frequency	%
No complaints	6	33,3
Light complaints can be ignored 1x in 1 month	9	50,0
Moderate complaints can not be ignored, 1x in 1 week	3	16,7
Total	18	100

Table 12 shows mild complaints with nine patients (50.0%), six patients with no complaints 33.3% and three patients with moderate complaints 16.7%.

Table 13: Frequent clearing of the throat/throat mucus.

	Frequency	%
No complaints	1	5,6
Light complaints can be ignored 1x in 1 month	8	44,4
Moderate complaints can not be ignored, 1x in 1 week	4	44,4
Heavy complaints affecting lifestyle, several times a week	1	5,6
Total	18	100

Table 13 shows that patients with mild and moderate complaints with the number of patients 8 (44.4%)

followed by no complaints and with severe complaints with the number of patients 1 (5.6%).

Table 14: Excessive Mucus/Post Nasal Drip (PND).

	Frequency	%
No complaints	7	38,9
Light complaints can be ignored 1x in 1 month	7	38,9
Moderate complaints can not be ignored, 1x in 1 week	4	16,7
Heavy complaints affecting lifestyle, several times a week	1	5,6
Total	18	100

Table 14 shows seven patients with mild and no complaints, 38.9% followed by three patients with moderate complaints, 16.7%, and one patient with severe complaints.

Table 15: Difficulty Swallowing.

	Frequency	%
No complaints	10	55,6
Light complaints can be ignored 1x in 1 month	8	44,4
Total	18	100

Table 15 shows ten patients had no complaints 55.6%, followed by eight patients with mild complaints 44.4%.

Table 16: Cough after eating/lying down.

	Frequency	%
No complaints	5	27,8
Light complaints can be ignored 1x in 1 month	10	55,6
Moderate complaints can not be ignored, 1x in 1 week	3	16,7
Total	18	100

Table 16 shows ten patients with mild complaints 55.6%, followed by five patients with no complaints 27.8% and three patients with moderate complaints 16.7%.

Table 17: Difficulty Breathing/Chocking.

	Frequency	%
No complaints	8	44,4
Light complaints can be ignored 1x in 1 month	5	27,8
Moderate complaints can not be ignored, 1x in 1 week	4	22,2
Heavy complaints affecting lifestyle, several times a week	1	5,6
Total	18	100

Tabel 17 memperlihatkan 8 pasien tidak ada keluhan sedang dengan jumlah pasien 4 22,2% dan 1 pasien dengan keluhan sangat berat 5,6%.

Tabel 1. Annoying Cough.

	Frequency	%
No complaints	2	11,1
Light complaints can be ignored 1x in 1 month	7	38,9
Moderate complaints can not be ignored, 1x in 1 week	6	33,3
Heavy complaints affecting lifestyle, several times a week	2	11,1
very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 18 shows seven patients with mild complaints 38.9%, six patients with moderate complaints 33.3%, followed by two patients with no complaints, severe complaints with two patients 11.1% and one patient with very severe complaints 5.6%.

Table 19: A lump in the throat.

	Frequency	%
No complaints	3	16,7
Light complaints can be ignored 1x in 1 month	7	38,9
Moderate complaints can not be ignored, 1x in 1 week	6	33,3
Heavy complaints affecting lifestyle, several times a week	1	5,6
very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 19 shows seven patients with mild complaints 38.9% followed by moderate complaints with a total of 6

patients 33.3%, three patients no complaints 16.7%, one patient with severe complaints 5.6%, and very severe complaints with a total patient 1 5.6%.

Table 20: Heartburn, Chest Pain, Indigestion, Acid Regurgitation.

	Frequency	%
No complaints	5	27,8
Light complaints can be ignored 1x in 1 month	4	22,2
Moderate complaints can not be ignored, 1x in 1 week	6	33,3
Heavy complaints affecting lifestyle, several times a week	4	11,1
very heavy, complaints significantly affect lifestyle, every day	1	5,6
Total	18	100

Table 20 shows six patients with moderate complaints 33.3% followed by five patients with no complaints 27.8%, mild complaints with a total of 4 patients 22.2%,

two patients with severe complaints 11.1% and one patient with heavy 5.6%.

Table 21: Analysis of the Average RSI Score Before and After PPI Therapy.

	Mean	Frekuensi	Std. Devices
Score Before Therapy	16,7778	18	2,102
Score After Therapy	9,9444	18	2,155

Based on Table 21 above, it is known that the number of each data is 18. The score before therapy has an average

score of 16.77, while there is a decrease after therapy. It has an average value of 9.94.

Table 22: Analysis of symptom improvement in patients with laryngopharyngeal reflux after PPI therapy.

	Mean	Std Deviation	t	df	Sig (2-tailed)
Before Therapy-After Therapy	6,8333	1,38267	20,968	17	,000

Table 22 shows that the sig value is $0.00 < 0.05$, so that there is an average difference between before and after therapy. There is improvement in symptoms after PPI administration.

The results of this study indicate that the average age of the research subjects is 21 years. In the study of Belafsky et al. and Kornel, most of the age experienced LPR >40 years^[29] due to changes in the laryngeal mucosa, namely the presence of oedema in the superficial layer in the lamina propria which in women after menopause. Changes in the laryngeal glands that can cause reduced mucus production, histologically in old age, the granular endoplasmic reticulum and Golgi apparatus in the mucus and serosa of the larynx are found to be less so that it can affect their secretion.

Changes can also occur in the epithelial mucosa from the vocal folds to become thin so that at the age of > 40 years, the larynx becomes sensitive when exposed to acidic substances and can increase the occurrence of LPR. In old age, histologically, the endoplasmic reticulum and Golgi apparatus can be found a little in the mucus and serous larynx so that the secretions secreted are small. In addition, there can also be changed in the supralaryngeal area to atrophy of the facial, pharyngeal and masticatory muscles accompanied by weakness of the oesophageal sphincter muscle to facilitate reflux.^[30]

The number of research subjects was 18 subjects. Seven

men (38.9%) and 11 women (61.1%) women suffered more from LPR. It is the same as that obtained by Koufman et al^[31], and Kornel et al., can be caused by hormonal factors that increase the production of acid secretion and can directly stimulate parietal cells and peptic glands without intervention the nervous system. This pathway can be mediated starting from the hypothalamus, anterior pituitary gland and ACTH, which can affect the adrenal glands, which produce cortisone and adrenals, stimulating parietal cells and peptic glands to stimulate the glands to produce HCl and pepsin.

The main complaint that brought the subjects in this study to come for treatment was heartburn. LPR patients with complaints of heartburn can be associated with the possibility of abnormalities in the oesophagus. LPR is also considered a symptom of extraesophageal reflux so that LPR patients can also experience symptoms of heartburn and acid regurgitation.^[32] Heartburn can occur due to repeated exposure to gastric acid in the oesophagus due to reflux. As a result, it will cause an inflammatory reaction in the oesophagus and cause pain in the pit of the stomach. It is different from previous studies in the Cornell Study. The main complaint of most subjects to come for treatment is clearing the throat because the ciliated respiratory epithelium in the larynx can increase the number the system blocks reflux fails.

Furthermore, it can not function normally in cilia, which will cause mucus accumulation, so there can be a post-

nasal drip and can stimulate coughing/throat clearing. Irritation from reflux fluid can cause coughing and choke directly. It is obtained from the sensory nerves sensitivity in the larynx that is stimulated due to the surrounding inflammation. Combining these factors can cause vocal folds, ulcers and granulomas.^[33]

In this study, the subject's BMI was the most normal. Body mass index (BMI) is one of the risk factors that cause LPR obesity can cause an increase in intra-abdominal pressure according to research by Francis et al. However, there is a study conducted by Halum et al. showing that there is no relationship between the occurrence of increased BMI and obesity with pharyngeal reflux. Obesity is associated with oesophageal reflux that occurs in GERD.^[34]

In this study, the selection for treatment using Lansoprazole 30 mg. There are still many studies on the effectiveness of PPI drugs until now. Lansoprazole is pharmacokinetically superior to omeprazole due to its high bioavailability. On the other hand, interactions with other drugs are few and do not cause a reduction in B12 absorption as with omeprazole.^[35] A PPI for 14 days was used to determine the sensitivity of the test to the duration of treatment.

For the management of LPR, four categories can be used: 1) proton pump inhibitors (PPIs), anti-LPR drugs that are currently the most effective in stopping gastric acid secretion; 2) H₂ receptor antagonists PPIs are effective anti-reflux drugs in suppressing gastric acid production compared with H receptor antagonists such as ranitidine, cimetidine, nizatidine, famotidine, which can also reduce gastric acid secretion (3) prokinetic agents such as metoclopramide cisapride which can accelerate clearance from the oesophagus and can increase the sphincter pressure below the oesophagus (4) mucosal cryoprotectant which functions to protect the mucosa from acid and pepsin.^[36] H₂ antihistamines are widely used to treat disorders associated with stomach acid; however, proton pump inhibitors are the drugs of the first choice.

LPR can also be affected by H. Pylori infection. Hasan Sadikin Bandung Nurrokhawati et al. Regarding the effectiveness of giving antibiotics with Lansoprazole in LPR with H.pylori infection. Combined antibiotics and Lansoprazole were more effective in improving clinical symptoms and quality of life when compared to no lansoprazole in LPR with H. pylori infection.^[37] PPIs have a short half-life of 90 minutes with an oral dose of 20 mg and inhibit 70% of the enzyme pump. Inhibition of gastric secretions is active for about 24 hours. Approximately 20% of the new proton pumps will be synthesized within 24 hours. At night, the synthesis of pumps is more significant than during the day. It is estimated that about 70% of the pump will be active at breakfast. PPIs are given about 30-60 minutes earlier to inhibit stably at a once-daily dose of about 66% of

maximum acid yield. Increasing the dose has almost no effect once the dose is reached, but increasing the dose frequency can have some effect. Dosing in the morning and the dose in the evening before meals results in about 80% inhibition of maximal acid yield.^[38]

Dietary behaviour remains the first step for therapy in patients with LPR, the best cost-effective empiric treatment for these patients. Patients following the diet had better symptoms than those not on a diet. From recent research, a diet that can be done well can be as efficient as PPI treatment. Alkaline, protein, low fat, and low acid diets are effective because these types of foods can be digested well and reduce sphincter relaxation. Long-term use of PPIs has also been associated with the development of fundal polyps, and all changes in the mucosa can increase gastric carcinogenesis. Inhibited secretion of gastric acid can decrease physiological defence mechanisms against bacterial pathogens. Diarrhoea is a well-known side effect of PPI use caused by bacterial infection.^[39]

1 The mean score before therapy in this study was 16.78, with a standard deviation **1** 2.102. After giving Lansoprazole PPI for 14 days twice a day before meals, there was a decrease in the RSI score to 9.994 with a standard deviation of 2.155. These results follow the study conducted by Febriyanti, in which there was a significant difference, namely 18.47 with **1** standard deviation of 4.35 before PPI administration to 10.94 with a standard deviation of 3.90 after two weeks of administration with omeprazole 20 mg twice a day before eating ($p < 0.05$). In this study, after administering Lansoprazole for 14 days, there was an improvement in all RSI symptoms. The same as the study conducted by Sri Edah et al. where LPR patients with the treatment given for three months improved all symptoms.

1 CONCLUSION

2 Based on the results of this study, the description of laryngopharyngeal reflux patients based on the RSI after PPI administration at the UKI General Hospital **1** showed a decrease in symptom scores. The mean score before therapy in this study was 16.78, with a standard deviation of 2.102. **1** After administering the PPI Lansoprazole for 14 days twice a day before meals, there was a decrease in the RSI **2** score to 9.994 with a standard deviation of 2.155. 18 LPR patients came for treatment at the ENT-KL clinic at UKI Hospital. Women are the most common gender. The majority of the patients who came were 21 years old. It is hoped that this research can assist medical personnel in filling out the RSI score. Further research is needed regarding adherence to taking PPI drugs. This study only uses the RSI form; it is hoped that further research will use the RSI and assess it using a physical examination.

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