Effect of Proton Pump Inhibitor on Quality of Life in Patients having Laryngopharyngeal Reflux Disease

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ABSTRACT

Introduction: Laryngopharyngeal reflux is defined as the reflux of gastric content into the larynx and pharynx with symptoms like foreign body sensation in the throat, cough, heartburn, difficulty in swallowing, and hoarseness. Objective of this study was to find the effect of proton pump inhibitor on quality of life in patients having laryngopharyngeal reflux disease.

Method: A Prospective study was conducted in Department of Ear Nose Throat (ENT) at Devdaha Medical College, Butwal between March 2023 to May 2023. Patients with suspected laryngopharyngeal reflux were evaluated using Reflux Symptom Index (RSI) and Reflux Finding Score (RFS) and treated with proton pump inhibitors (PPIs). Pre and post therapeutic RSI and RFS were compared.

Result: A total of 75 patients were included over a period of 3 months. Mean total score of RSI and RFS before therapy was 1.51±2.102 and 0.99±1.297 and after therapy RSI and RFS was 0.87±1.383 and 0.44±0.773 ($p<0.005$) respectively.

Conclusion: RFS and RSI are convenient and helpful in diagnosing LPR. Its use may prevent the unnecessary costs of invasive laboratory studies and imaging and time consuming examinations.

Keywords: Laryngopharyngeal reflux (LPR), reflux finding score (RFS), reflux symptom index (RSI).

Introduction

Laryngopharyngeal reflux (LPR) refers to the retrograde flow of stomach contents into the throat and larynx, which leads to symptoms such as chronic dysphonia, throat clearing, cough, globus sensation, and sore throat.[1] The most typical signs and symptoms used to identify LPR are globus, throat clearing, cough, hoarseness, hurting or burning throat, dysphagia, and dysphonia. The association between reflux and onset of laryngeal mucosal changes arose from the observation that epithelium of the larynx and pharynx does not have the same protective mechanisms as the esophagus resulting in greater sensitivity to contact with the acidic gastric contents. Unlike patients with classic gastro esophageal reflux disease (GERD), patients with LPR often do not complain of heartburn or other symptoms of esophagitis.[2] This is because the pathogenesis of LPR differs from that of GERD. GERD is usually attributable to a dysfunction of the lower esophageal sphincter, which exposes the esophagus to pathologic levels of acid . On the other hand, LPR is believed to occur as a result of upper esophageal sphincter dysfunction. The currently recommended treatment of LPR is to pair dietary and lifestyle changes with pharmaceutical intervention using primarily proton pump inhibitors (PPIs).[3]

The main objective of this study was to find the effect of proton pump inhibitor on quality of life in patients having laryngopharyngeal reflux disease and to help us in achieving an early diagnosis of laryngopharyngeal reflux (LPR) and thereby reducing serious complications of LPR such as laryngeal granuloma, subglottic stenosis, laryngospasm and laryngeal carcinoma.

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Methods

This is a prospective cross-sectional study conducted in

ENT department of Devdaha Medical College. Study was conducted from March 2023 to May 2023. The IRC was approved on 11th November 2022.

Sample size was calculated by following formula.[4]

$N= (Z\alpha/2+Z\backslash\beta)^2 *2\ \sigma^2 / (\mu1-\mu2)^2$

N=Sample size 75

Zα/2=standard normal z value for a significance level α =0.05 which is 1.96

Zβ=standard normal z value for the power of 8o%, which is 0.84

σ is standard deviation

μ1= mean before treatment

μ2= mean after treatment

Inclusion Criteria: Patient diagnosed as laryngopharyngeal reflux based on the Reflux Symptom Index (RFS) and Reflux Finding Score (RFS) questionnaires. After informed consent, the diagnosed patients were included in the study with age greater than 18 years.

Exclusion Criteria: Patients who had prior surgery for gastro esophageal reflux disease or received any medical treatment previously and having gastritis, unwilling to participate in the study, had a history of neurological illness, co-morbidities such as asthma, chronic obstructive pulmonary disease (COPD), or any other laryngeal pathologies were excluded from the study.

The RFS and RSI questionnaires (Table 1, 2) were used for scoring.[5] RSI questionnaire was fill up at the first visit and if scores came greater than or equal to 13 then they were included in the study and the RFS Questionnaire was filled by the primary physician after performing fiber optic laryngoscopy, and if scores came greater than or equal to 7 then patients were considered as positive for LPR disease and included in the study. Preferences was given to use RSI and RFS because it is easily administered, highly reproducible, and exhibits excellent construct-based and criterion-based validity. Also takes less than 1 minute to complete, and manifests excellent inter - and - intra observer reproducibility. Although each item on the RFS is entirely subjective, the overall finding score reliably documents improvement with antireflux therapy.

All patients meeting the inclusion criteria completed a questionnaire at the start of study the questionnaire consisted of smoking, alcohol use and presence of symptoms according to RSI Patients were asked on the presence or absence of symptoms, such as hoarseness, throat clearing cough, lump in throat, heartburn, regurgitation, problem swallowing, chest pain, and excess throat mucus. And also patients were score the severity using a scale of 0 to 5{0 (no problem) to 5 (severe problem)}. Each patient underwent a complete ENT examination followed by laryngeal endoscopy. The diagnosis of LPR was made based on RSI and RFS. Patients with RSI greater than 13 and RFS greater than 7 were given PPIs. laryngeal endoscopy was repeated after 8 weeks and RSI and RFS were calculated again.6 Data were collected through a pre-designed questionnaire, and was code entered and analyzed using Microsoft Excel 2018 and simple statistical test and SPSS version 20.

Table 1: Reflux Finding Score (RFS)

S N	Clinical diagnosis	Scoring system
1	Pseudosulcus	0 = absent; 2 = present
2	Ventricular obliteration	0 = no; 2 = partial; 4 = total
3	Erythema/hyperemia	0 = no; 2 = arytenoids; 4 = diffuse
4	Edema of the vocal cords	0 = no; 1 = medium; 2 = moderate; 3 = severe; 4 = polypoid
5	Diffuse laryngeal edema	0 = no; 1 = medium; 2 = moderate; 3 = severe; 4 = obstructive
6	Hypertrophy of posterior commissure	0 = no; 1 = medium; 2 = moderate; 3 = severe; 4 = obstructive
7	Granuloma/granulation	0 = absent; 2 = present
8	Dense endolaryngeal mucous	0 = absent; 2 = present

Table 2: Reflux Symptom Index (RSI)

SN	Clinical symptom	Grading of scores
1	Hoarseness or a problem with your voice	0 1 2 3 4 5
2	Clearing your throat	0 1 2 3 4 5
3	Excess throat mucus or feeling of postnasal drip	0 1 2 3 4 5
4	Difficulty swallowing food, liquids, or tablets	0 1 2 3 4 5
5	Coughing after eating or lying down	0 1 2 3 4 5
6	Breathing difficulties or choking episodes	0 1 2 3 4 5
7	Troublesome or annoying cough	0 1 2 3 4 5
8	Sensation of something sticking in your throat or of a lump in your throat	0 1 2 3 4 5
9	Heartburn, indigestion, or stomach acid coming up (dyspepsia component mentioned in the text)	0 1 2 3 4 5

Results

In the present study, there were 75 patients having a mean age of 46.11±12.566 years.

The majority (65.33%) were of the female gender. There were 22.66% of patients found with smoking, 5.33% with alcohol consumption and 8 % with both alcohol and smoking. (Table 4).

Table 3: Gender distribution of patients (n=75)

Sex	No.	%
Male	26	34.66
Female	49	65.33
Mean ± SD	46.11	12.56

Table 4: Personal History of the population (n=75)

Variables	No.	%
Smoking	17	22.66
Alcohol	4	5.33
Both (smoking+alcohol)	6	8
Total	75	100

Out of the total, 73.33% had complaints of sensation of something sticking in throat, 48% had dysphagia, 45.33% had clearing of throat, 37.33 % had postnasal discharge, 28% had complaints of heartburn, 28 % had coughing, 25.33% had complaints of hoarseness, 22.66% had cough after lying, and 12% had breathing difficulties (Table 5)
Similarly, after doing laryngeal endoscopy, out of 75, 84 % had erythema /hyperemia, 64% had thick endolaryngeal mucus, 50.66 % had diffuse laryngeal edema 46.66% had posterior commisure hypertrophy, 29.33% had ventricular obliteration, 26.66% had vocal fold edema, 17.33% had subglottic edema and 8% had granulations (Table 6). The total score of RSI pretreatment and post treatment are shown in (Table 7) and total score of RFS pretreatment and post treatment are shown in (Table 8).
Statistically significant difference was observed in RSI and RFS between pre and post treatment with Proton Pump Inhibitor (PPI). Mean total score of RSI and RFS before therapy was 1.51 ± 2.102 and 0.99 ± 1.297 and had reduced to RSI and RFS was 0.87 ±1.383 and 0.44 ± 0.773 ($p<0.005$) respectively after therapy.

Discussion

A frequent chronic inflammatory disease, laryngopharyngeal reflux disease shares many of the same clinical signs as other common chronic laryngopharyngeal diseases because of its lack of specificity,which explains why it is easy to be misdiagnosed. RSI and RFS score scales are currently primarily used to screen patients for diseases, making it possible to swiftly and reliably evaluate patients clinical symptoms and indicators while accurately diagnosing diseases.[7] LPR symptoms had a significantly greater

Table 5: Clinical presentation and reflux symptom index (RSI) (n=75)

S.N	Variables	No.	%
1	Sensation of Something Sticking in throat	55	73.33
2	dysphagia	36	48
3	Clearing of throat	34	45.33
4	Post nasal discharge(pnd)	28	37.33
5	Heart Burn	21	28
6	Cough	21	28
7	Hoarseness	19	25.33
8	coughing After Lying	17	22.66
9	Breathing difficulties	9	12
	Total	75	100.0

Table 6: Distribution of endoscopic diagnosis with Reflux Finding Score (RFS)

S.N	Endoscopic diagnosis	No.	%
1	Erythema	63	84
2	Thick Endolaryngeal reflux	48	64
3	Diffuse Laryngeal Edema	38	50.66
4	Posterior commisure hypertrophy	35	46.66
5	Ventricular obliteration	22	29.33
6	Vocal fold edema	20	26.66
7	Subglottic edema	13	17.33
8	Granulations	6	8
	Total	75	100.0

Table 7: Pretreatment score and posttreatment score (RSI)

S.N	Clinical presentation	Pretreatment score	Posttreatment score
1	Hoarseness	73	50
2	Clearing of throat	136	66
3	Post nasal discharge	130	78
4	Dysphagia	137	72
5	Coughing	85	48
6	Breathing difficulties	38	22
7	Sensation of something stuck in throat	236	139
8	Coughing after lying	71	36
9	Heartburn	95	80

Table 8: Pretreatment score and posttreatment score (RFS)

S.N	Endoscopic findings	Pretreatment score	Posttreatment score
1	Subglottic edema	26	6
2	Ventricular obliteration	62	34
3	Erythema	166	78
4	Vocal fold edema	54	25
5	Diffuse laryngeal edema	94	44
6	Granulation	12	6
7	Thick endolaryngeal mucus	96	42
8	Posterior commisure hypertrophy	81	29

negative impact on the lifes of older patient.[8] In our study we found the mean age of patients who were diagnosed with laryngopharyngeal reflux was 46.11±12.566 years, which was comparable with the study of Kamani et al.[9] The most likely reason for the increased severity of GERD in older people is the cumulative injury of acid to the esophageal mucosa over time A defective antireflux barrier, abnormal esophageal clearance, altered esophageal mucosal resistance, and delayed gastric emptying could contribute to this phenomenon.[8] While most of the patients were female (65.33%) in our study which is similar to the study conducted by pokhrel et al.[10] This may be due to female taking spicy food, lying in bed immediately after taking meal, lack of exercises and stress. In our study the most common complaint were sensation of something sticking in throat (73.33%) and dysphagia (48%) in contrast to other studies where excess throat mucus (post nasal discharge) and heart burn were main complaint.[5] Similarly, in our study erythema (84%) were the most common sign seen in larynx noticed in direct laryngoscopy which was similar to the study conducted by Quadeer et al.[11] In our study, proton pump inhibitor was administered twice daily for two month which is similar to study done by Kahrilas et al.[12] The RFS and RSI showed significant improvement after initiation of treatment for the 8 week, respectively, and the p-value was found to be significant (< 0.05). The study was found comparable with Silvaas et al.[13] and Belafsky.[4] Belafsky continued treatment for a period of six months, whereas in our study treatment was given for two months and in contrast to our study Guo et al.[14] and Lam et al.[15] found that treatment with PPI improve only RSI but no improvement in RFS.

Five PPIs are currently widely available: esomeprazole, lansoprazole, omeprazole, pantoprazole, and rabeprazole . The next four substances are combinations of racemic isomers, while esomeprazole consists solely of omeprazole S isomer. The different PPIs have minute structural variations that could impact their antisecretory efficacy and therapeutic usefulness.[16] Patients with LPR were prescribed 15 mg of lansoprazole 2 times a day for 3 months by Junseok lee et al. [17] in their study and they also found the RSI and RFS score were improved after the treatment which was comparable to our study where we have given the pantoprazole 40 mg twice daily for 2 months. Examples of behaviors that can mirror other potential causes of chronic laryngitis include endolaryngeal abnormalities in LPR, include smoking and alcoholism, which can induce an inflammatory response in the respiratory mucosa. Controversy exists as to the effect of alcohol consumption on GERD as results of different studies are diverse and contradictory. The only previous study that to our knowledge directly addressed the issue concluded that alcohol use is moderate risk factor for reflux symptoms. Kamani et al.[9] and Nilsson et al.[18] both also found that alcohol not to be a risk factor for LPR related symptoms.

The Limitation of our study is small sample size, and there can be different results for other geographical location inside our country. Due to the invasive nature and cost of the test, no comparison with ambulatory 24-hour double probe monitoring has been done in this study.

Conclusion

The improvement of patient symptoms with LPR occurs over 2 months of therapy with twice-daily proton pump inhibitors. RFS and RSI are convenient and helpful in diagnosing LPR, and they can be easily implemented in ENT clinics for the subjective and objective assessment of LPR. Its use may prevent the unnecessary costs of invasive laboratory studies and imaging.

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Conflict of interest: None.

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