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Original Research Article

Role of reflux symptom index score in diagnosis of laryngopharyngeal reflux

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ABSTRACT

Background: The retrograde flow of gastric contents to the upper aero digestive tract is known as laryngo pharyngeal reflux disease (LPRD). Diet and lifestyle play a huge role in the pathophysiology of LPR.
Methods: A hospital based cross sectional study in the Department of ENT, KMCT, Kozhikode. 291 Patients were selected from those who presented to the OPD with throat symptoms who scored >10 in a questionnaire (Reflux symptom Index) that was provided and were advised to undergo video laryngoscopy and their reflux finding score (RSI)was calculated. LPRD prevalence, RSI/Reflux Findings Score (RFS) correlations, and clinical/ laryngoscopic (video laryngoscopy) associations were analyzed.
Results: LPRD prevalence was 68.7%, higher in females (60.1%) and the 41-50 age group (31.3%). Increased spicy food/caffeine intake and shorter dinner-bedtime intervals were significantly associated. Heartburn/indigestion was the most common symptom, with RSI mean 12.94±2.26. Erythema/hyperaemia was the most frequent laryngeal finding, with RFS mean 8.47±2.40. RSI and RFS scores significantly correlated.
Conclusions: This study demonstrates a high LPRD prevalence among patients with throat symptoms, particularly in females aged 41-50 and influenced by dietary/lifestyle factors. RSI effectively identified LPRD in this resource-constrained setting, highlighting its diagnostic value. These findings provide valuable insights for managing and further investigating LPRD.

Keywords: Laryngopharyngeal reflux disease, Prevalence, Throat symptoms, Reflux symptom index, Reflux findings score

INTRODUCTION

Laryngopharyngeal reflux disease (LPRD) has emerged as a prevalent diagnosis in Otorhinolaryngology practice over the last two decades, affecting a substantial portion of clinical patients. Approximately 10% of individuals in clinical settings and up to 50% of those presenting with voice disorders are reported to exhibit associated LPRD.[1] Distinguished by the retrograde flow of gastric contents into the upper aero digestive tract, LPRD, also known as extra esophageal reflux, induces inflammation leading to chronic laryngeal symptoms and signs. While closely related to gastroesophageal reflux disease (GERD), LPR is recognized as the most common extra esophageal manifestation of GERD.[1] The distinction between LPRD and GERD, both in terms of signs and symptoms, as well as diagnostic criteria and treatment approaches, has garnered significant attention in the last two decades.[2-5] James Koufman's seminal description of LPR as a distinct entity in 2002 marked a pivotal moment, though the first reported case dates back to 1947 by Delahunty and Cherry. Research has since conclusively established the differences between LPRD and GERD, contributing to a nuanced understanding of their respective clinical

presentations and management protocols.[2-5] In the esophagus, a degree of gastro-esophageal reflux is considered physiologically normal as long as the exposure time does not exceed 5 % in 24 hours. Although the esophagus is lined by resilient stratified squamous epithelium, the tissue damage is thought to be acid mediated. In contrast the larynx is lined by areas of delicate squamous epithelium and respiratory epithelium, here the refluxate when present is neither removed by peristalsis nor neutralized by bicarbonate.

Tissue damage is thought to be mediated by activated pepsin, and can occur very rapidly following exposure times, which maybe as brief as 30 seconds 3 times per week. LPR events often occur in the upright rather than supine position. Unlike the lower esophagus, reflux episodes in the laryngopharynx are primarily gaseous, with fine aerosol droplets that can easily access the nasopharynx and lower respiratory tract.[6]

Changes in eating habits and sedentary lifestyles have contributed to an increased incidence of reflux, presenting with symptoms such as altered voice, globus sensation, swallowing difficulty, throat clearing, chronic cough, among others. While LPRD shares certain characteristics with GERD, its distinct patterns, mechanisms, manifestations, and treatment necessitate a separate diagnostic approach. Notably, LPRD patients often present with head and neck symptoms, and heartburn is an uncommon complaint. The existence of LPRD as an independent entity, even in the absence of GERD-related symptoms, underscores the need for a comprehensive diagnostic tool.[6]

Despite the well-known symptoms of LPRD, its diagnosis remains challenging due to the lack of a standardized diagnostic tool. The Reflux Symptom Index (RSI), introduced by Belafsky et al in 2002, offers a valuable classification of laryngopharyngeal reflux symptoms. The RSI questionnaire allows patients to score individual symptoms, and a total score exceeding 10 indicates a potential LPRD problem, with scores over 20 and 30 signifying moderate and severe conditions, respectively. Additionally, Belafsky proposed the Reflux Finding Score (RFS) to quantify laryngeal inflammatory signs through videolaryngoscopic findings, aiming to reduce diagnostic subjectivity. Geographical variations in diet and lifestyle contribute to diverse symptomatology and findings related to laryngopharyngeal reflux.[7]

This study focuses on the northern region of Kerala, where the scarcity of research on LPRD prompted our investigation. Our primary objective is to assess the prevalence and predisposing factors leading to LPRD in this region. Furthermore, we aim to validate the efficacy of the Reflux Symptom Index as a cost-effective diagnostic tool, facilitating accurate management even in peripheral healthcare settings and reducing the risk of complications associated with LPRD in the future.

METHODS

Study design

This was a hospital-based prospective cross-sectional study.

Study area

The study was conducted at the Department of ENT, KMCT Medical College, Mukkam, was initiated following the receipt of ethical clearance from the institute's regulatory and ethics committees.

Study duration

The study was completed in about a year, from May 2022 to June 2023.

Study population

Patients that present to ENT OPD of KMCT medical college, mukkamwith throat symptoms with Reflux symptom index score >10.

Sample size

Consecutive participants attending ENT-out patient department of KMCT Medical College, Mukkam, who were within the inclusion and exclusion criteria were the subjects of the study. Sample size was calculated with the formula- 4pq/D2=291, p-0.45(prevalence from previous studies), q- 100-p=0.55, D=allowable error=15%.

Inclusion criteria

Patients who were between the age group of 18 and 80 with symptoms suggestive of laryngopharyngeal reflux disease with a reflux symptom index of 10 or more.

Exclusion criteria

Patients presenting with throat symptoms, having a reflux symptom index score less than 10 were excluded from the study, along with patients who have undergone medical treatment past 6 weeks or surgical treatment for similar complaints, with malignancy of hypopharynx and esophagus, neurological cause of dysphonia and dysphagia, a history of throat trauma or prior intubation. Patients with allergy or chronic upper respiratory tract infection. Pregnant patients and who fell below the age of 18 and above 80 were also excluded.

After obtaining approval from the institute regulatory committee and ethics committee, the study is proposed to be done in department of ENT, KMCT medical college, Mukkam, Kozhikode. A sample size of 291 was selected based on the inclusion and exclusion criteria. The primary tool employed for data collection was the reflux symptom index (RSI), a quantitative questionnaire

consisting of nine questions scored from 0 to 5. Consecutive participants from the ENT outpatient department with an RSI score greater than 10 were included in the study. Following informed consent, eligible participants underwent video laryngoscopy using a 70° rigid endoscope, serving as the diagnostic tool for LPR. RFS, an 8-item clinical severity scale, was calculated based on the video laryngoscopy findings to assess the severity of laryngopharyngeal reflux. The collected data, including RSI and RFS scores, were coded and entered into Microsoft Excel for subsequent statistical analysis using SPSS statistical software version 25.0.

Statistical analysis

Descriptive statistics, such as mean and standard deviation or median and interquartile range, were utilized for quantitative variables, while the Mann-Whitney test and Pearson Chi-square test were employed to assess statistical significance between groups, contributing to a comprehensive evaluation of LPR prevalence in the study population.

RESULTS

The demographics of our study participants revealed that the majority were females (60%) and fell within the 41-50 age group (31%). Nearly all participants (99%) consumed caffeine regularly, most commonly through tea or coffee. Spicy food consumption was universal, with a substantial portion (60%) having it daily. Chocolate, was typically enjoyed sporadically (<2 times weekly for 77%). Interestingly, most participants (60%) had dinner within 2-3 hours of bedtime, potentially impacting reflux-related symptoms.

Presenting symptoms reflected a strong presence of gastroesophageal reflux disease (GERD) manifestations. Heartburn, chest pain, indigestion, and recurrent throat clearing were reported by a high number of participants (87% each). Sensation of something in the throat was also prevalent (77%). The mean RSI score further reinforced this trend, reaching 12.94±2.26, indicating significant symptom burden.

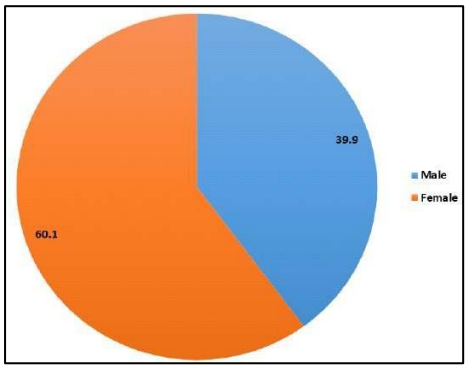

Figure 1: Sex distribution.

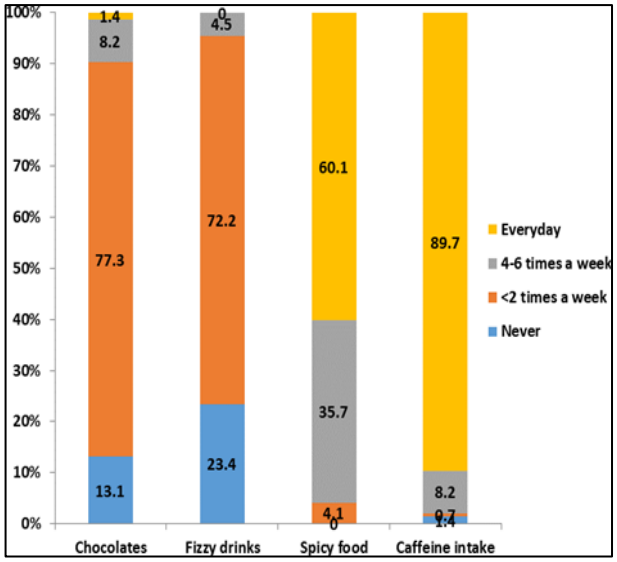

Figure 2: Predisposing factors of LPR.

The most common symptoms observed in the study were heartburn, chest pain, indigestion (87%) and recurrent clearing of throat (87%), followed by sensation of something in their throat (77%). The least was found to be breathing difficulty which was reported by only 3% of the subjects. Mean Reflux index score of 291 patient is 12.94±2.26.

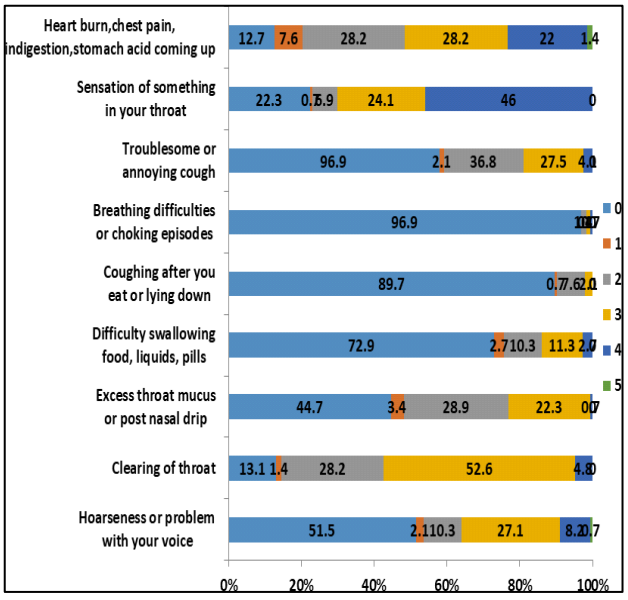

Figure 3: Reflux symptom index score.

Video laryngoscopy provided valuable insights into the laryngeal effects of reflux. The laryngoscopic examination revealed a clear predominance of erythema/hyperemia of the arytenoids and surrounding area, observed in a staggering 98% of participants. Vocal fold edema was also common (80.4%), with a small subset (8.9%) exhibiting polypoidal changes. Diffuse laryngeal edema was present in the majority (77%). Subglottic edema and ventricular obliteration were less

frequent, occurring in 15.8% and 43.4% of participants, respectively. Based on video laryngoscopy and reflux finding score (RFS), 68.7% of participants were diagnosed with LPRD. Importantly, RSI scores demonstrated a significant correlation with RFS scores ($p<0.001$), highlighting the potential of RSI as a valuable diagnostic tool for LPRD, even in this large cohort.

Table 1: Mean RFS and RSI score.

RFS and RSI	
Reflux symptom index	
Mean±SD	12.94±2.26
Median(IQR)	12 (11-14)

Table 2: Correlation between reflux symptom index and reflux finding score.

	Reflux finding score	
	Correlation coefficient	**P value**
Reflux symptom index	0.490	<0.001*

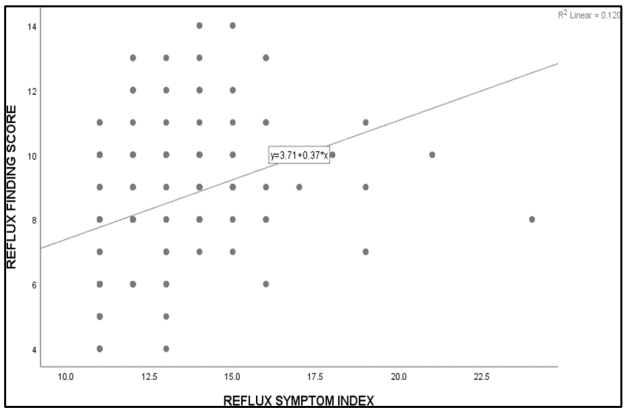

Figure 4: Correlation between reflux symptom index and reflux finding score.

DISCUSSION

Our study revealed a female preponderance in LPRD, similar to reports by Mishra et al. (2020) (55% female) and Karakaya et al (63% female).[8,9] While our subjects were primarily aged 41-50 (31.3%), Mishra et al observed a younger demographic (21-40 years) and Karakaya et al reported a mean age of 39.09±14.43 years.[8,9] These variations suggest potential regional and demographic influences on LPRD prevalence.

Our findings highlight the role of diet in LPRD development. Consistent with Wang et al. (2023), we observed high intakes of spicy food (60% daily) and caffeine (90% daily) among subjects with LPRD.[10] Interestingly, Karakaya et al reported hoarseness and throat clearing as the most common symptoms, while our study identified heartburn/indigestion (87.3%) as the primary complaint, similar to Mishra et al.[8,9] These discrepancies, along with the shorter dinner-to-bedtime interval in our study (59.8% within 2-3 hours) compared to Wang et al. (2023) ,10 further emphasize the impact of dietary and lifestyle factors on LPRD presentation. The mean RSI score in our study (12.94±2.26) aligns with (18.22).[8] While Dawood et al reported hoarseness as the most frequent symptom , our study, like Mishra et al, identified heartburn/indigestion as the primary complaint.[8] However, compared to Karakaya et al where hoarseness and throat clearing were dominant our findings revealed a wider symptom spectrum, including throat clearing (86.9%), foreign body sensation (77.7%), and troublesome cough (70.5%).[9] These variations suggest regional and cultural influences on symptom expression. Laryngoscopic findings in our study, with erythema/hyperemia and posterior commissure hypertrophy as the most common observations, resonate with Kirti et al and Mishra et al in India.[7,8] However, studies outside India often report thick endo laryngeal mucus, vocal cord edema, and posterior commissure hypertrophy as the main laryngeal findings. These discrepancies may reflect differences in disease progression, diagnostic criteria, or endoscopic assessment techniques. Authors have done the study on a limited population, hence there a narrow frame for generalizability of results.

CONCLUSION

In conclusion, our revealed a notable prevalence of laryngopharyngeal reflux disease (LPRD) in individuals presenting with throat symptoms and a reflux symptom index (RSI) score exceeding 10. Females exhibited a higher susceptibility to LPRD than males, with a predominant occurrence observed in the 41-50 age group. Noteworthy lifestyle factors associated with LPRD included an increased intake of spicy food and caffeine, coupled with a reduced duration between dinner and bedtime.

Our findings, with a mean RSI score of 12.94±2.26, underscored the importance of recognizing heartburn/indigestion as the most prevalent symptom, while breathing difficulty was identified as the least common. The mean Reflux Finding Score (RFS) in our study was 8.47±2.40, with erythema/hyperemia of the larynx emerging as the most frequent finding, followed by posterior commissure hypertrophy, and granuloma or granulation as the least observed.

Significantly, our study demonstrated a statistically significant correlation between RSI and RFS scores, affirming the reliability of RSI scoring as a valuable and cost-effective tool for diagnosing LPR. As a result, we advocate for increased patient education regarding the potential health risks associated with the overconsumption of spicy foods and caffeinated drinks. The affordability and efficacy of the reflux symptom index score make it an invaluable resource for healthcare

workers, especially in resource-constrained settings, enabling the identification of symptom severity and facilitating prompt evaluation and appropriate treatment decisions, ultimately enhancing patient outcomes.

Recommendations

Our study demonstrates that LPRD prevalence and presentation, while sharing some general trends, can vary across geographies. Dietary habits, lifestyle factors, and cultural influences likely contribute to these discrepancies. Our findings strongly support the use of RSI as a valuable diagnostic tool for LPRD, as evidenced by its significant correlation with RFS scores. Future research should explore the regional and cultural factors influencing LPRD presentation to understand its diverse manifestations and develop region-specific management strategies. Investigating the genetic and environmental interplay in LPRD pathogenesis could also provide valuable insights for personalized healthcare approaches.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Gaur S, Panakkal AS, Arora U, Singh V. Clinical correlation of reflux finding score with reflux symptom index in diagnosis and management of laryngopharyngeal reflex disease in a tertiary care hospital, western up. ENT-Updates. 2021;11(1):14-7.
2. Jain RK, Roy S. Diverged otorhinolaryngological manifestations of reflux disease in indian condition: a base line data generation. Int J Phono surg Laryngol 2016; 6 (1):20-6.
3. Koufman JA. The otolaryngologic manifestations of gastroesophageal reflux disease (GERD): A clinical investigation of 225 patients using ambulatory 24-hour pH monitoring and an experimental investigation of the role of acid and pepsin in the development of laryngeal injury. Laryngoscope. 1991;101(53):1-78.
4. Koufman JA. Laryngopharyngeal reflux is different from classic gastroesophageal reflux disease. Ear Nose Throat J 2002;81(9):7-9.
5. Delahunty JE, Cherry J. Experimentally produced vocal cordgranulomas. Laryngoscope 1968; 78(11):1941-7.
6. Watkinson JC, Clarke RW, Donne AJ. Scott Browns Int J Otorhinolaryngol Head Neck Surg. 2018;8:1093-8.
7. Kirti YK. Reflux finding score a Quantitative guide for diagnosis and treatment of laryngopharyngeal reflux. In J Otolaryngol Head Neck Surg. 2018;70:362-5.
8. Mishra P, Agrawal D, Artham P. Screening test for lprd: history versus video laryngoscopy. Indian J Otolaryngol Head Neck Surg. 2020;72(4):422-7.
9. Karakaya NE, Akbulut S, Altıntaş H, Demir MG, Demir N, Berk D. The reflux finding score: reliability and correlation to the reflux symptom index. J Acad Res Med. 2015;5(2):68-74.
10. Wang M, Mo T, Tan J, Dai Y, Li X. Risk factor-related lifestyle habits of patients with laryngopharyngeal reflux. Ear Nose Throat J. 2022;1455613221078182.
11. Dawood MR. A clinical diagnosis of laryngopharyngeal reflux in patients with voice related problems via correlation between reflux symptoms and laryngoscopic findings. Madridge J Otorhinolaryngol. 2018;3(1):55-9.
12. Kirti YK. Reflux finding score (RFS) a quantitative guide for diagnosis and treatment of laryngopharyngeal reflux. Indian J Otolaryngol Head Neck Surg. 2018;70(3):362-5.
13. Munjal M, Vohra H, Munjal S, Kumar A, Sharma A, Singh S, et al. The human larynx –an anatomical aspect: a review. Int J Otorhinolaryngol Head Neck Surg. 2021;7:207-12.
14. Hrelec C, Zhang E. Anatomy and physiology of phonation. Int J Head Neck Surg. 2021;12(4):125-30.

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