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Original Research Article

Assessment of video-laryngoscopic examination in patients of LPRD in a tertiary care hospital

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ABSTRACT

Background: Laryngopharyngeal reflux disease (LPRD) is characterized by vague symptoms, often leading to delayed presentation and advanced disease, potentially increasing the risk of malignancy. The extent and clinical features of this condition remain poorly understood among patients seeking Otorhinolaryngology services in Bihar.
Methods: This descriptive cross-sectional study was conducted at Narayan Medical College and Hospital within the Department of Otorhinolaryngology. It included patients exhibiting symptoms of Laryngopharyngeal reflux disease. Data collection utilized questionnaires and clinical examination forms, with analysis performed using Microsoft Excel. Results were presented through frequency tables, cross-tabulations, and figures.
Results: In this study, 210 participants were enrolled, of whom 137 (65.24%) were females. The median age was 35.5 years with an interquartile range of 21-50 years. The prevalence of Laryngopharyngeal reflux disease was found to be 18.57%, with no gender preference observed. The most common symptoms reported were globus sensation and hoarseness of voice, affecting 97.44% and 94.87% of participants, respectively. The most frequently observed signs included thick endo laryngeal mucus (94.87%) and erythema/hyperemia (84.62%). Risk factors identified included lying down within two hours after meals and consumption of spicy foods. The most prevalent comorbid conditions associated with Laryngopharyngeal reflux disease were hypertension and Type 2 diabetes Mellitus.
Conclusion: The prevalence of laryngopharyngeal reflux disease is high among patients attending Otorhinolaryngology services at Narayan medical College and hospital. All patients with laryngopharyngeal reflux disease related symptoms should get thorough evaluation for early diagnosis and treatment.

Keywords: Laryngopharyngeal reflux disease, Reflux symptom index, Reflux finding score, Tertiary hospital

INTRODUCTION

Laryngopharyngeal reflux disease (LPRD) is a condition that is often overlooked but holds significant public health importance due to its impact on morbidity and mortality. It adversely affects quality of life (QoL), impairs work performance, and leads to financial losses.[1,2] LPRD is implicated in the development of laryngeal squamous cell carcinoma and adenocarcinoma of the distal esophagus.[3,4] Unlike gastroesophageal reflux disease (GERD), which causes heartburn and is influenced by posture, LPRD involves the backward flow of stomach contents into the larynx and pharynx independently of posture.[5] Despite its implications, LPRD has historically been underdiagnosed and undertreated.[6,7] Research has linked LPRD with various laryngeal conditions, ranging from functional issues such as muscle tension and dysphonia, to structural abnormalities like spasm and stenosis, and even malignant transformation.[8-12] Factors such as increased tobacco and table salt consumption are associated not only with hypertension and renal disease but also with elevated LPRD risk, whereas physical exercise and dietary fiber intake have been shown to reduce this risk.[13]

Diagnosing LPRD can be challenging due to its atypical symptoms and common risk factors shared with conditions like infection, allergies, smoking, and poor voice hygiene.[14] In 2002, Belafsky et al introduced the Reflux Symptom Index (RSI) to classify LPRD symptoms, and more recently proposed the Reflux Finding Score (RFS) using videolaryngoscopic findings to enhance diagnostic objectivity.[15] Clinical diagnosis of LPRD typically involves history taking and examination with flexible or rigid laryngeal endoscopy.[16] Further investigations are warranted for patients with uncertain diagnoses or inadequate treatment responses. Globally, LPRD prevalence ranges from 5% to 30%, with an 11% prevalence in the Indian population based on an RSI score >13.[17]

METHODS

A descriptive cross-sectional study was carried out at Narayan Medical College and Hospital, involving adults aged 15 years and older who presented with voice changes and/or globus sensation. Patients with diagnosed laryngopharyngeal or esophageal malignancy, active throat infection, organic laryngeal disorders, or those already on long-term PPI therapy were excluded. A total of 210 patients participated in the study after providing informed consent.

Data collection procedures

Data were collected using the Reflux Scoring Index (RSI) and Reflux Finding score (RFS). Patients were given the RSI table to either read and respond to independently or, if unable to read, had questions read aloud by a research assistant. Responses were recorded by circling corresponding numbers on the RSI table. A diagnostic cut-off point of RSI 13 was used. Patients who scored RSI 13 or higher underwent laryngoscopic examination using a Karl Storz rigid endoscope (70-degree scope).

For patients unable to undergo rigid laryngoscopy, flexible nasopharyngoscopy was conducted by the principal investigator to minimize biases. A total RFS of 7 was considered diagnostic for LPRD. Laryngoscopy also assessed for vocal lesions and other complications related to reflux disease. Patients not meeting diagnostic criteria were treated according to their specific medical needs. Quality control: Research assistants were given training on RSI and RFS prior to commencing the research to minimize bias. Laryngoscopy was done by the principal investigator.

Data management

Data was checked for accuracy and completeness then coded and entered into Microsoft excel sheet. The results presented in frequency tables, cross tabulations and figures. Relationship between the independent variables and the dependent variable was established using Chi-square test of association, a variable with p value of equal or less than 0.05 was considered to be statistically significant.

RESULTS

Out of 210 participants, females were 65.24%. Majority of participants belong to the age group 31-40 years 41.90% and the least belongs to the age group between 41-50 years 11.90%. The median age with their interquartile range in years was 35.5 (21-50) years. (Table 1). The overall prevalence of LPRD was 18.57%, with male and female prevalence being 17.81% and 18.98% respectively with p value =0.555 suggests that there is no significant association between gender and LPRD positivity/negativity in this dataset (Table 2). The most common symptoms were Globus sensation 97.44%, followed by hoarseness of voice 94.87% while the least common was difficult swallowing 28.21%. The association between LPRD and hoarseness of voice was statistically significant as the Fisher exact test statistic yielded a value of less than 0.00001, indicating a highly significant result. This finding meets the criterion for statistical significance at $p<0.05$ (Table 3).

The most observed sign was thick endo laryngeal mucus 94.87%, while the least observed signs were granuloma formation and subglottic edema with 7.69% and 21.29 % respectively. The findings were statistically significant with $p<0.001$ (Table 4), (Figure 1,2 and 3). Among the known risk factors going to sleep less than two hours after meal and eating spice or fat foods were mostly reported 87.2% and 72.3% respectively, however obesity was strongly associated with LPRD and the association was statistically significant ($p=0.012$, Figure 4).

Among the known associated co morbid conditions of LPRD, this study found that diabetes mellitus type 2 and hypertension were most prevalent by 42.6% and 34.0% respectively; while the least associated was chronic infectious lung disease 12.8%. Findings were statistically significant for diabetes, asthma, chronic lung disease, bowel and ear diseases ($p<0.05$, Table 5).

Table 1: Social demographic characteristics (n=210).

Age groups (years)	N (%)
<20	30 (14.29)
21-30	40 (19.05)
31-40	88 (41.90)
41-50	25 (11.90)
>51	27 (12.86)
Total	210 (100)

Table 2: Prevalence of LPRD by sex.

Sex	LPRD positive	LPRD negative	Total
Male	13 (17.81%)	60 (82.19%)	73 (34.76%)
Female	26 (18.98%)	111 (81.02%)	137 (65.24%)
Total	39 (18.57%)	171 (81.43%)	210 (100%)

Table 3: Symptoms among patients with LPRD (n=39).

Symptoms	LPRD positive N (%)
Hoarseness of voice	37 (94.87)
Sensation of lump in the throat (Globus)	38 (97.44)
Excessive urge to clear throat	30 (76.92)
Sensation of mucous sticking in the throat or postnasal drip	28 (71.79)
Chronic cough	22 (56.41)
Difficulty in swallowing	11 (28.21)
Sore throat	29 (74.36)
Heart burn	27 (69.23)
Bitter saliva	23 (58.97)

LPRD-Laryngopharyngeal reflux disease.

Table 4: Endoscopic findings among patients of LPRD (n=39).

Sign	N (%)
Subglottic edema	11 (28.21)
Ventricular obliteration	23 (58.97)
Erythema / Hyperemia	33 (84.62)
Vocal cord edema	17 (43.59)
Diffuse laryngeal edema	25 (64.10)
Posterior commisure hypertophy	35 (89.74)
Granuloma	3 (7.69)
Thick endolaryngeal mucous/others	37 (94.87)

Table 5: Comorbid disease conditions and LPRD.

Comorbid disease conditions	LPRD positive N (%)	P value
Hypertension		
Yes	13 (34)	0.199
No	26 (66)	
Diabetes mellitus type 2		
Yes	17 (42.6)	0.003
No	22 (57.4)	
Asthma		
Yes	8 (21.3)	0.005
No	31 (78.7)	
Chronic infectious lung disease		
Yes	5 (12.8)	0.026
No	34 (87.2)	
Chronic inflammatory bowel disease		
Yes	7 (19.1)	0.034
No	32 (80.9)	
Chronic Ear disease		
Yes	10 (25.5)	0.001
No	29 (74.5)	

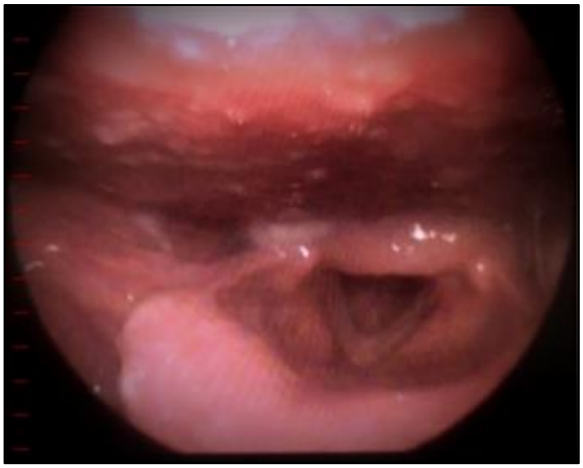

Figure 1: Posterior commissure hypertrophy with diffuse laryngeal edema.

Figure 2: Thick endo laryngeal mucous.

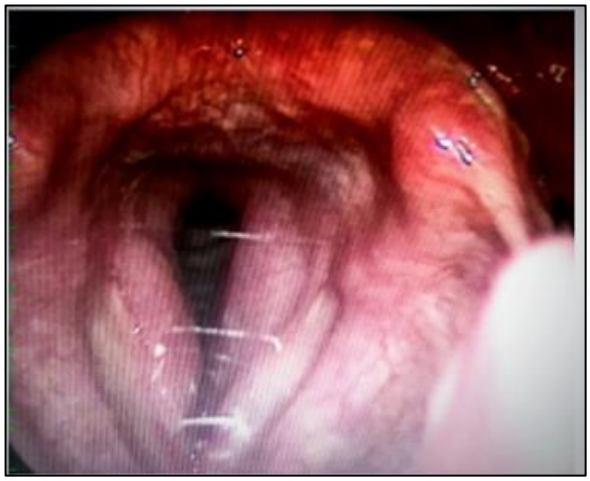

Figure 3: Diffuse laryngeal edema with subglottic edema with thick endo laryngeal mucous with vocal fold edema (these are some of the pictures taken during videolaryngoscopic examination of LPRD positive patients).

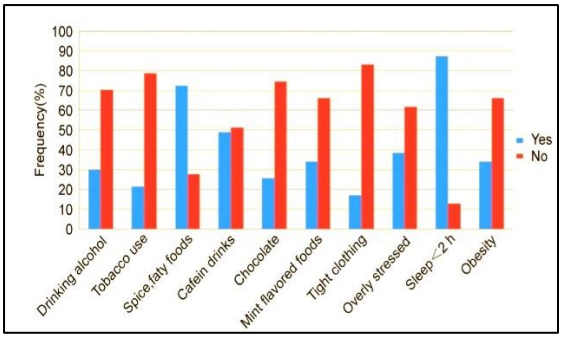

Figure 4: Risk factors of laryngopharyngeal reflux disease.

DISCUSSION

The research involved 210 participants, with a balanced gender distribution (17.81% males vs 18.98% females), and no significant difference in Laryngopharyngeal Reflux Disease (LPRD) between sexes, consistent with previous findings.[18,19] However, some studies have reported a higher prevalence of LPRD among females, possibly due to variations in diagnostic tools and methodologies used by different researchers. The median age was 35.5 years (interquartile range-21-50 years), similar to findings in other studies.[19-23]

LPRD prevalence varies across countries and regions.[24] At Narayan Medical College, the prevalence was 18.57%, akin to 18.8% in Greece, but lower than 23.9% in China and 34.4% in the United Kingdom, and higher than 15% in Latvia.[25-27] However, the study acknowledges that this prevalence might not reflect the overall prevalence in society, as many patients are treated in peripheral hospitals, and those with severe symptoms are seen by Otorhinolaryngologists (ENT surgeons). A more comprehensive understanding requires data from both hospital and community-based studies.

The most commonly reported symptoms among diagnosed LPRD patients were globus sensation (97.44%), hoarseness of voice (94.87%), and excessive urge to clear throat (76.92%), consistent with previous research.[19,21,28] Less frequently reported symptoms included bitter saliva (58.97%), chronic cough (56.41%), and difficulty swallowing (28.21%). There was a statistically significant association (P<0.00001) between LPRD and hoarseness of voice.

Clinically, thick endolaryngeal mucus (94.87%), posterior commissure hypertrophy (89.74%), and erythema/hyperemia (84.62%) were the most observed signs among LPRD patients, similar to findings by other authors.[19,29,30] Conversely, subglottic edema (28.21%) and granuloma formation (7.69%) were less frequently observed, consistent with other studies, but contrasting with findings by Belafsky and Koufman.[18,20,29]

Among known risk factors, going to sleep less than two hours after a meal and consuming spicy or fatty foods were strongly correlated with LPRD, whereas moderate correlations were found with caffeine consumption, smoking, and alcohol intake. These findings partly align with other studies where alcohol, tobacco, and caffeine were identified as increasing LPRD risk.[31] Differences in risk factor patterns may be attributed to cultural, geographical, and social behavioral factors among study populations. High BMI was significantly associated with LPRD (P<0.012), consistent with another research.[19,32]

Evidence suggests that up to 41.8% of LPRD patients suffer from concurrent conditions such as cardiovascular, gastrointestinal, musculoskeletal, respiratory, and endocrine diseases.[33] This study found a strong correlation between LPRD and type 2 diabetes mellitus and hypertension, similar to findings in other studies.[34,35] Associations were statistically significant (P<0.005) between LPRD and chronic ear disease, chronic inflammatory bowel disease, chronic lung disease, and type 2 diabetes mellitus, consistent with other research.[19,26,33,36,37].

CONCLUSION

Laryngopharyngeal reflux disease is highly prevalent among patients visiting the ENT Department at Narayan Medical College and Hospital. The most frequent symptoms reported include globus sensation and hoarseness of voice, while common signs observed among LPRD patients are thick endolaryngeal mucus and erythema/hyperemia. Common risk factors include early bedtime after meals and consumption of highly spiced foods. Diabetes mellitus type 2, chronic ear disease, and hypertension are frequently associated comorbid conditions with LPRD.

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