



Correlation of Clinical Symptoms and Laryngoscopic Signs in Reflux Laryngitis

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Abstract

Aims: To assess the Correlation between the Clinical Symptoms and Laryngoscopic findings of Reflux Laryngitis using the Reflux Symptoms Index (RSI) and the Reflux Finding Score (RFS).

Materials and Methods: Cross-sectional study conducted in the Department of Otorhinolaryngology, from January 2018 to December 2018. 75 patients were included in the study. Detailed history was taken and the symptoms were graded based on the RSI. After this initial evaluation, patients were subjected to video laryngoscopy and changes were graded based on the RFS.

Results: Out of 75 patients (40 males, 35 females), all patients presented with heartburn. Among them 98% patients had non-specific complaints like constant clearing of throat and feeling of lump in the throat and 56% had complains of hoarseness of voice. On fiberoptic laryngoscopic examination, 98% of patients were found to have erythema/hyperemia, 96% of patients had posterior commissure hypertrophy. 93.3% had vocal fold oedema and only 62.7% of patients showed partial ventricular obliteration. The mean RSI in those with significant findings was found to be statistically significant (p value = 0.054) indicating that those with an abnormal RSI are likely to have significant findings.

Conclusion: The analysis concludes that RSI v/s RFS are statistically significant (p value = 0.007) which means that when a patient has an abnormal RSI and a positive RFS, a likely diagnosis of LPR can be made with the help of these two complimentary scores.

Keywords: Laryngopharyngeal Reflux; GERD; Reflux Laryngitis; RSI; RFS

Abbreviations

GERD: Gastroesophageal Reflux Disease; URTI: Upper Respiratory Tract Infection; LPR: Laryngopharyngeal Reflux; UES: Upper Esophageal Sphincter; RSI: Reflux Symptom Index; RFS: Reflux Finding Score

Introduction

The proximity of the larynx to the upper end of esophagus makes it susceptible to diseases that occur in these areas, mainly due to reflux of gastric contents called gastroesophageal reflux disease (GERD) [1]. Unfortunately, there is a substantial percentage of medical professionals that are unaware of the problems that gastroesophageal reflux causes in these areas.

Laryngitis is defined as “inflammation of, laryngeal structures commonly the laryngeal mucosa” [2]. It can be either acute or chronic. Acute laryngitis is a common condition affecting the vocal folds and supraglottis, secondary usually to upper respiratory tract infection (URTI), but can also be due to inhalational of toxic fumes, allergy or intubation. Chronic laryngitis can either be infectious or non-infectious, the latter being more common, occurring secondary to smoking, voice abuse and/or esophageal reflux.

The association of gastro-esophageal reflux (GERD) with chronic laryngitis was given by Delahunty in 1972 [3]. In a small case series of around 8 patients, barium swallow was used to detect GERD which when treated, the chronic laryngitis also was seen to settle. Therefore, GERD has a significant contribution, although the etiology of chronic laryngitis is dependent on number factors.

Therefore, Laryngopharyngeal reflux (LPR) is different to GERD and is caused by the retrograde passage of gastric contents from the upper oesophageal sphincter (UES) [4].

Therefore, it is also defined as an extra esophageal manifestation of GERD [5]. The exposure causes injury to the mucosa and damage to the respiratory epithelium which causes mucous stasis, which in turn results in troubling symptoms. The exact mechanism is unclear and it is said to occur either directly (microaspiration) or indirectly (vagal stimulation) [6,7].

Globus pharyngeus and hoarseness are the commonly described symptoms. Globus is described as 'sticking sensation in throat', whereas hoarseness is the reduced vocal quality and clarity. Dysphagia is described difficulty in swallowing and it is important to differentiate this from obstructive causes of dysphagia [1].

Hence, the diagnosis is unclear and fogged by non-specific symptoms and signs and crossed over with differentials such as upper respiratory infection, asthma, vocal abuse, and allergy. The mucosal changes are evaluated during endoscopic examination, which makes laryngoscopic examination an important device for diagnosis of LPR [8].

Therefore, this disease is a conceptual dilemma. As there is a lack of such studies in India, this study aims at establishing diagnosis of Laryngopharyngeal Reflux among the people and helping the medical professionals to manage it efficiently.

Materials and Methods

75 patients were included in this single blinded study.

The inclusion criteria: All cases who present to the ENT OPD with typical and atypical symptoms (hoarseness, throat cleaning, dry cough, globus sensation, etc.) of GERD and patients between the ages of 20 - 60 years were included.

Patients with history of chronic smoking or chronic alcoholics, with chronic cough associated with history of COPD/asthma, professional voice users or patients with history of voice abuse, patients with previous history of any upper GI or respiratory malignancy or previous radiotherapy for head and neck surgeries and patients with history of recent intubation, prolonged intubation or intubation injury were excluded from the study.

These patients were given the RSI scoring system printed on a sheet and asked to grade their symptoms. The symptoms graded

based on the "Reflux Symptom Index (RSI)" facilitated the clinical diagnosis. A score > 13 (on a scale of 0 to 5, with maximum 45 points) was considered abnormal.

After this initial evaluation, all patients with abnormal RSI were subjected to video laryngoscopic examination using a fiber optic endoscope, after spraying with local anesthetic agent to avoid gag reflex, by the same expert examiner always, after explaining the procedure and taking consent.

Laryngoscopic changes of each patient was noted methodically by the expert examiner and the findings were graded based on the "Reflux Finding Score (RFS)". A score > 7 (out of maximum 26) was considered significant.

Analysis of variance (ANOVA) has been used to find the significance of study parameters between the groups of patients, Student t test to find the significance of study parameters on continuous scale between two groups. Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Results and Discussion

Laryngopharyngeal reflux is a diagnostic dilemma. Although its mechanism of occurrence is not confirmed, certain symptoms and specific laryngoscopic findings may help in its diagnosis. To help the clinicians, Belfsky, *et al.* [9,10] developed the RSI and RFS.

This study included 75 patients, most of them (38.7%) were found to be in the age group of 30 - 40 years, with the rest of the age groups having similar number of patients. These included 40 males and 35 females.

100% of the patients (n = 75) presented with heartburn. Among them 98% patients had non-specific complaints like constant clearing of throat and feeling of lump in the throat i.e. globus and more than half of them had complains of hoarseness of voice (Table 1). The average score of RSI was 20.45 (ranging from 17 - 24).

To confirm the diagnosis patients with abnormal RSI underwent a fibreoptic laryngoscopic examination a findings were scored according to RFS. 98% of patients were found to have erythema/hyperemia out of which 56% showed erythema of only the arytenoids. Along with erythema 96% of patients had posterior commissure hypertrophy, 93.3% had vocal fold oedema and only 62.7% of patients showed partial ventricular obliteration (Figure 1).

Reflux symptom index (components)	No. of patients
Hoarseness	65
Lump in the throat	73
Heart burn	75
Constant clearing of throat	70
Post nasal drip	3
Difficulty swallowing	42
Coughing on lying down	3
Chocking/difficulty breathing	0
Troublesome cough	54

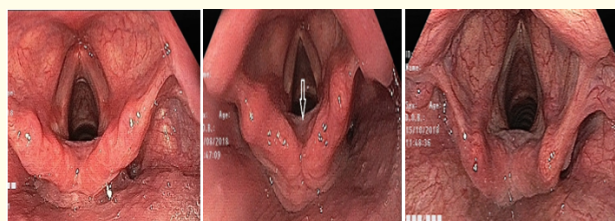


Figure 1: Laryngoscopic picture showing (a) diffuse laryngeal erythema (b) posterior commissure hypertrophy (c) vocal fold edema causing ventricular obliteration.

Table 1: Reflux symptom index of patients studied.

Reflux finding score	Gender		Total (n = 75)
	Female (n = 35)	Male (n = 40)	
Subglottic edema			
Absent	33 (94.3%)	33 (82.5%)	66 (88%)
Present	2 (5.7%)	7 (17.5%)	9 (12%)
Ventricular obliteration			
Absent	6 (17.1%)	2 (5%)	8 (10.7%)
Partial	23 (65.7%)	24 (60%)	47 (62.7%)
Complete	6 (17.1%)	14 (35%)	20 (26.7%)
Erythema			
Absent	1 (2.9%)	0 (0%)	1 (1.3%)
Arytenoids only	19 (54.3%)	23 (57.5%)	42 (56%)
Diffuse	15 (42.9%)	17 (42.5%)	32 (42.7%)
Vocal fold edema			
Absent	4 (11.4%)	1 (2.5%)	5 (6.7%)
Mild	14 (40%)	14 (35%)	28 (37.3%)
Moderate	14 (40%)	23 (57.5%)	37 (49.3%)
Severe	3 (8.6%)	2 (5%)	5 (6.7%)
Diffuse laryngeal edema			
Absent	6 (17.1%)	3 (7.5%)	9 (12%)
Mild	11 (31.4%)	13 (32.5%)	24 (32%)
Moderate	14 (40%)	18 (45%)	32 (42.7%)
Severe	4 (11.4%)	6 (15%)	10 (13.3%)
Posterior commissure hypertrophy			
Absent	2 (5.7%)	1 (2.5%)	3 (4%)
Mild	15 (42.9%)	13 (32.5%)	28 (37.3%)
Moderate	12 (34.3%)	23 (57.5%)	35 (46.7%)
Severe	6 (17.1%)	3 (7.5%)	9 (12%)
Granulation			
Absent	32 (91.4%)	36 (90%)	68 (90.7%)
Present	3 (8.6%)	4 (10%)	7 (9.3%)
Thick end laryngeal mucus			
Absent	33 (94.3%)	34 (85%)	67 (89.3%)
Present	2 (5.7%)	6 (15%)	8 (10.7%)

Table 2: Reflux finding score distribution of patients studied.

55 patients were found to have significant findings and the mean RSI in those with significant findings was found to be statistically significant (p value = 0.054) indicating that those with an abnormal RSI are likely to have significant findings (Table 3 and 4).

Significant Findings	No. of patients	%
No	20	26.7
Yes	55	73.3
Total	75	100.0

Table 3: Significant Findings distribution of patients studied.

	Significant Findings		Total	P value
	No	Yes		
Patients with Abnormal RSI	5.55 ± 1.47	12.51 ± 3.15	10.65 ± 4.17	< 0.001**

Table 4: Patients with abnormal RSI studied in relation to significant findings on RFS.

RSI v/s RFS was found to be statistically significant (p value = 0.007) which means that when a patient has an abnormal RSI (score > 13) and a positive RFS (score > 7) and a likely diagnosis of LPR can be made.

Discussion

Laryngopharyngeal reflux/Reflux laryngitis is a diagnostic dilemma, often presenting with non-specific symptoms to the ENT clinic. Although its mechanism of occurrence is not confirmed, certain symptoms and specific laryngoscopic findings may help in its diagnosis.

The Reflux symptom index in a self-administered, nine item outcome instrument for LPR. As a result of vast difference in etiology and other scores being lengthy, which rely on typical GERD symptoms, the RSI was developed for the otolaryngologists to assess LPR. It can be completed in less than a minute, it has a list of 9-symptoms which are graded as: 0 (no problem) to 5 (severe problem) with a maximum score of 45 points.

The above symptoms can be accounted for by the direct and indirect mechanisms by which acid reflux takes place through the UES. Although the duration of exposure is short, the mucous membrane of the larynx is sensitive to even small amounts of acid exposure which causes inflammation and oedema.

In a study conducted on 62 patients over 1 and a half years by U. Cesari, *et al.* [11] confirmed the estimated incidence of LPR in patients presenting with voice disorders reported in literature. The

study concluded that “significant correlation between the severity of voice disorder and laryngoscopic findings exists.” This concurred with my study.

Also in a study done by Carlos Eduardo Dilen da Silva, *et al.* [12] over 8 months concluded that “the most common symptoms were dry cough, foreign body sensation in the throat and throat clearing.” The same was also seen in my study. In contrast to many studies, heartburn as seen in all the patients of my study, which added to the confusion.

To confirm the diagnosis patients with abnormal RSI underwent a fibreoptic laryngoscopic examination a findings were scored according to RFS. The RFS contains 8-items based on the findings of flexible laryngoscopy. The score ranges from 0 (No abnormality) to 26 (Worst possible score). Study conducted by Carlos Dilen da Silva, *et al.* [12], which concluded that “there was statistically significant correlation between hoarseness and foreign body sensation with findings of posterior commissure hypertrophy.” The mean RSI was found to be statistically significant indicating that those with an abnormal RSI are likely to have significant findings.

Conclusion

Laryngopharyngeal reflux/Reflux laryngitis being a diagnostic dilemma requires comprehensive evaluation of the symptoms first. In our study the RSI helped evaluate the symptoms, and all patients with abnormal RSI (> 13) were included in our study (n = 75). We found that:

- There was no significant sex predilection but majority of the patients were in age group 30 - 40 years.
- Globus pharyngeus (“feeling of lump in throat”) and hoarseness of voice were the most significant presenting complaints in patients with heartburn.
- The mean RSI was found to be 20.45 ± 3.54.

All these patients were subjected to flexible fibreoptic laryngoscopy, and the findings were scored using the RFS. We found that:

- 82.7% (n = 62) had a score above 7, suggesting that these patients had significant findings due to reflux.
- The mean RFS was found to be 10.65 ± 4.17.
- Erythema/Hyperemia, posterior commissure hypertrophy, vocal fold edema and partial ventricular obliteration were the most significant findings.

All the above findings have significant effect on the voice explaining the hoarseness. Erythema and posterior commissure hypertrophy explains the constant feeling of lump in the throat.

Thus, we can conclude that RSI and RFS are easy, quick, reproducible and complimentary scores that can be used to make a diagnosis of LPR.

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Conflict of Interest

All authors declare they have no conflict of interest and have not received any funding.

Ethical Approval

All procedures performed in this study are with the ethical standards of the institute.

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