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The Reflux Symptom Index (RSI) as a Diagnostic Tool for Laryngopharyngeal Reflux (LPR)

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ABSTRACT

Laryngopharyngeal reflux (LPR) is the backflow of gastric contents into the laryngopharynx, where the gastric contents will come into contact with the upper aerodigestive tract tissue. These clinical entities are known to profoundly affect the patient's quality of life, altering sleep and daily activities and reducing the effectiveness of the speaker's communicator. The Reflux Symptom Index (RSI) was developed in 2001 for the purpose of diagnosing laryngopharyngeal reflux. The RSI is a validated nine-item instrument that focuses on LPR symptoms, including hoarseness, frequent clearing of the throat, globus, cough, and dysphagia. A score of more than 13 was considered abnormal and reflected LPR, and improvement at an RSI > 5 points was considered clinically significant.

1. Introduction

Laryngopharyngeal reflux (LPR) is the backflow of gastric contents into the laryngopharynx, where gastric contents will contact the upper aerodigestive tract tissue. These clinical entities are known to profoundly affect the patient's quality of life, altering sleep and daily activities and reducing the effectiveness of the speaker's communicator.[1,2] In general, LPR can cause 50-78% of voice complaints and 91% of voice disturbances in the elderly. Clinical symptoms that can be found in LPR include hoarseness, chronic cough, excessive throat clearing, vocal fatigue, post-nasal drip, Globus pharyngeus, and dysphagia. In addition to LPR, it can also cause several lesions in the larynx, including vocal granuloma, subglottic stenosis, muscle tension dysphonia, laryngospasm, and even laryngeal carcinoma. Backflow of gastric components into the aerodigestive tract results in an inflammatory reaction. The subsequent inflammatory reaction causes the following: (a) hypersecretion in the pharyngeal space; (b) accumulation of mucus; (c) sensation of post-nasal drip; (d) clearing the throat to clear the throat (throat clearing); and (e) a chronic cough that can trigger choking. Coughing, throat clearing, and the direct effect of acid gas can exacerbate laryngeal lesions, resulting in altered vocal cord constitution, contact ulcers, and/or granulomas, further producing LPR symptoms, such as hoarseness, Globus pharyngeus, and sore throat.[3-7] The exact pathophysiology of LPR is still uncertain. Pharyngeal and laryngeal mucosa cannot prevent direct injury from gastric acid and

pepsin contained in refluxate. Acidic fluid and pepsin are substances that are harmful to the larynx and surrounding tissues. Pepsin is the main proteolytic enzyme of the stomach. The optimal activity of pepsin occurs at a very low acidic pH (pH 2.0) and is stable at pH 6 but will reactivate if the pH can return to pH 2.0. Gastric acid in the distal part of the esophagus can also stimulate vagal reflexes resulting in bronchoconstriction, throat clearing, and chronic coughing. Over time it will cause lesions on the mucosa.[8]

The RSI is the only tool available to assess LPR severity subjectively. The RSI is a self-administered nine-item questionnaire that has been validated and translated into several languages. Belafsky, et al developed a diagnostic scoring system, namely the Reflux Symptom Index (RSI) to help clinicians assess the degree of LPR symptoms during the initial assessment and after treatment. An RSI score > 13 is considered an abnormal result.[9]

Reflux Symptom Index (RSI)

The Reflux Symptom Index (RSI) was developed in 2001 with the aim of diagnosing laryngopharyngeal reflux. The RSI is a validated nine-item instrument that focuses on LPR symptoms, including hoarseness, frequent clearing of the throat, globus, cough, and dysphagia. A score of more than 13 was considered abnormal and reflected LPR, and improvement at an RSI > 5 points was considered clinically significant.[10,11]

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The RSI is a nine-question chart that aims to determine the severity of symptoms associated with LPR. Each of the nine RSI questions is rated on a scale of 0 (no problem) to 5 (severe problem), with a maximum score of 45 indicating the most severe symptoms. Some degree of reflux is found in normal patients. An RSI more significant than 13 is considered abnormal.[16]

Table 1. Reflux Symptom Index (RSI)

Within the last month, how did the following problems affect you?	**0 = No problem 5 = Severe problem**					
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 postnasal drip	0	1	2	3	4	5
4. Difficulty swallowing food, liquid, or pills	0	1	2	3	4	5
5. Coughing after you ate or after 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 a lump in your throat	0	1	2	3	4	5
9. Heartburn, chest pain, indigestion, or stomach acid coming up	0	1	2	3	4	5
RSI > 13 = Abnormal	Total					

The reflux symptom index assesses nine symptoms that include sounds and traditional gastroesophageal reflux symptoms and includes things like heartburn, cough, globus, and sound dysfunction. Since the introduction of RSI, numerous studies have demonstrated the reliability and consistency of this method in various populations worldwide, establishing the method as a very useful diagnostic tool in everyday practice. Monitoring laryngopharyngeal pH and RSI score have the same value in diagnosing laryngopharyngeal reflux disease (LPRD). A study conducted in Greece using RSI as a diagnostic tool for LPR has found the prevalence of LPR to be 8.5% in the Greek population.[17-20]

In the study of patients with LPR, 78.8% scored >13 on the RSI at baseline. The study found a statistically significant increase in RSI after treatment of patients with paresis/vocal cord paralysis (P = 0.007), cyst/nodule/polyp (P = 0.002), atrophy (P = 0.011). Clinically significant improvement in RSI (five or more points) was demonstrated in more than 50% of patients with LPR, paresis/paralysis, leukoplakia, and dysphonia spasmodic. If the RSI was a specific assessment of LPR, the score would only increase in patients receiving reflux-related interventions, but in the study of Kavookjian et al.,[21], this was found to be insignificant. RSI is not sufficient to distinguish LPR from other laryngeal pathologies as causes of dysphonia, so RSI has never replaced the history, physical examination, and investigations for general causes of dysphonia. Clinical practice guidelines (CPG) for dysphonia, first published in 2009 and updated in 2018, strongly recommend laryngoscopy for patients with dysphonia lasting more than 4 weeks. Thus, the RSI is a sensitive tool for measuring symptom severity but is not specific enough to differentiate between the various pathologies that cause dysphonia due to the significant overlap of symptoms.[17]

The RSI score determined the severity of LPR, and in the study of Hameed et al., the mean RSI before treatment was 15.09 ± 7.51 and decreased at the end of therapy to 3.78 ± 4.94 (p = 0.000). Similar to Belafsky et al., the mean RSI before treatment was 21.2 ± 10.7, which showed a statistically significant reduction at the end of therapy to 12.8 ± 10.0 (p = 0.001). In the same study by Habermann et al. al. (N = 1044), the median RSI score before treatment was 12 and decreased at the end of therapy to 3, which is in line with our study.[20]

The mean RSI score in asymptomatic subjects was 11.6 (95% CI 9.7-13.6). This value for normality was significantly lower than in individuals with LPR who had not undergone treatment but was also statistically similar to the values observed in individuals with LPR. Thus, it was concluded that the RSI score > 13 was following the diagnosis of LPR. The percentage of patients with positive RSI was 37.9%, with a mean score of 13.7 ± 9.[5.6]

The RSI questionnaire is patient-dependent only. The average drawback of RSI is the lack of consideration of some common symptoms, such as sore throat, odynophagia, halitosis or regurgitation, and the lack of consideration of the frequency of symptoms. A high mean RSI score was established for the diagnosis of LPR. However, the RSI score indicated laryngeal irritation and was not specific for LPR.[17] However, overall, RSI can be used to establish the diagnosis of LPR, especially in health facilities that do not have endoscopic facilities, and is very useful in assessing the success of therapy.[3.20]

2. Conclusion

The Reflux Symptom Index (RSI) is an effective diagnostic tool for laryngopharyngeal reflux.

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