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CORRELATION BETWEEN REFLUX SYMPTOM INDEX VERSUS REFLUX FINDING SCORE IN LARYNGOPHARYNGEAL REFLUX DISEASE

ABSTRACT

Objective: To evaluate the correlation between Reflux Symptom Index (RSI) Versus Reflux Finding Score (RFS) and to find the prevalence of hypothyroidism in laryngopharyngeal reflux disease

Methods: This is a prospective, analytical study conducted from February 2022 to August 2022 among 75 patients in department of otorhinolaryngology, Shree Birendra hospital, Chaunni. RSI questionnaire with 9 questions were filled by the patients on 5 points scale. A score of more than 13 was considered diagnostic of LPR. RFS consists of scores from 0-4 determined by fiber-optic nasal endoscopy findings. Score more than 7 indicated LPR. Prevalence of hypothyroidism in all patients was calculated by evaluating serum thyroid function test

Results: The reflux symptom index was more than 13 on 41 patients with mean 13.28 ± 3.95 and reflux finding score was more than 7 on 23 patients with mean 6.43 ± 3.19 with statistically significant but with low correlation between reflux symptom index and reflux finding score ($p=0.027$, $r=0.25$). The prevalence of hypothyroidism in laryngopharyngeal reflux was similar to general population.

Conclusion: There was low correlation between reflux symptom index and reflux finding score in patient with laryngopharyngeal reflux. The prevalence of hypothyroidism in these patient was similar to the general population.

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

INTRODUCTION

Laryngopharyngeal reflux disease (LPRD) was first introduced by James in 1980.¹ "Reflux" meaning back flow of gastric contents into laryngopharynx leading damage to laryngeal tissue.² In 1996, Koufman proposed LPR to designate its symptoms, signs and its effects on laryngeal tissue.³ 10% of the patients visit otorhinolaryngologists with LPR symptoms and signs.¹ The laryngeal symptoms of LPR are cough, throat pain, hoarseness, dysphonia, globus sensation with signs of laryngeal irritation at laryngoscopy examination.⁴ In 2002, Belafsky et al published the Reflux Symptom Index (RSI) and Reflux Finding Score (RFS).

RSI is a classification of symptoms on the basis of 9 questionnaire answered on a 5-point scale.^{5,6} A RSI of more than 13 is considered to indicate LPR. RFS is based on laryngoscopic findings and Score more than 7 indicated presence of LPR.^{5,6}

Not only gastric contents but thyroid hormones also affect the larynx thereby resulting laryngeal manifestations of hypothyroidism. Few studies have suggested that the primary laryngologic complaint in hypothyroid patients are change in voice, dry cough and globus sensation.⁷⁻⁹ Therefore, hypothyroidism should not be missed when evaluating patient with laryngeal symptoms of LPRD.

Accurate and timely diagnosis is crucial for treatment of any disease. Few studies have been conducted which evaluated role of RSI and RFS in patients with laryngopharyngeal reflux disease.^{3,10-12} But to our knowledge, till date, no studies have explored the relation of the prevalence of hypothyroidism with symptoms and signs among LPR patients in a single study.

In this study we explored the correlation of the symptoms and signs i.e RSI and RFS and calculated the prevalence of hypothyroidism among LPRD patients. The result of our study may lead to use RSI and RFS as better diagnostic tools in managing LPRD and timely identification of hypothyroidism whose laryngeal manifestations may mask LPRD.

MATERIAL AND METHODS

This is a prospective, analytical study conducted from February 2022 to August 2022 in Shree Birendra hospital, Chaunni. The study was approved by Institution Review Board (IRB). A total of 75 patients were included. Individuals with suspected laryngopharyngeal reflux disease (LPRD) based on RSI and RFS were included. Patients with psychiatric disease, chronic obstructive pulmonary disease, asthma, URTI, allergic rhinitis, vocal cord pathology, Head and neck malignancy, already on thyroid supplement and PPI or H1 inhibitors, smokers, pregnancy were excluded. Each individual graded their symptoms with the severity score using a scale of 0 to 5 (0- no problem to 5 – severe problem). Thereafter, all patients underwent fiber- optic laryngoscopy

(FOL) using 70 degree endoscope (Karlstorz) and finding documented based on RFS rating scale (Table 2). The diagnosis of LPR was based on RSI and RFS scores. A RSI of more than 13 and RFS more than 7 indicated presence of LPR and were treated accordingly. Each individual was also advised to follow up with serum thyroid function test (TFT). RSI and RFS score with thyroid function test result were documented in proforma. Data analysis was done with SPSS software. The Pearson correlation coefficient for parametric variables was used to assess the degree of correlation and p less than 0.05 were considered as significant.

Table 1: Symptoms included and their scoring in

Reflux Symptoms Index (RSI) in patients

| Symptoms | Scores, 0=no problem, 5= severe problem | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Sensation of lump in the throat/globus | | | | | | |
| Heartburn, chest pain, indigestion/reflux | | | | | | |
| Throat clearance | | | | | | |
| Hoarseness | | | | | | |
| Coughing after eating or lying down | | | | | | |
| Post nasal drip or excess throat mucus | | | | | | |
| Difficulty in swallowing food, liquids or pills | | | | | | |
| Breathing difficulty or choking episodes | | | | | | |
| Annoying cough | | | | | | |
| Total score | | | | | | |

Table 2: Reflux Finding Score (RFS)

| Findings | Score |
|----------------------------------|---|
| Erythema/hyperemia | 0=absent 2=only in arytenoids 4=diffuse |
| Posterior commissure hypertrophy | 0=absent 1=mild 2=moderate 3=severe 4=obstruction |
| Vocal cord oedema | 0=absent 1=mild 2=moderate 3=severe 4=obstruction |
| Ventricular obliteration | 0=absent 2=partial 4=complete |
| Thick endolaryngeal sulcus | 0=absent 2=present |

| | |
|--------------------------|---|
| Pseudosulcus | 0=absent 2=present |
| Granuloma/granulation | 0=absent 2=present |
| Diffuse laryngeal oedema | 0=absent 1=mild 2=moderate 3=severe 4=obstruction |
| Total score | |

RESULTS

A total of 75 patients with symptoms and signs of LPR were enrolled. The age ranged between 17 to 65 years with a mean age of 43.04 ± 14.07 . Among them 52 were females and 23 were males.

Reflux Symptom Index

The most frequently found symptoms was globus (97.3%), followed by heart burn/reflux (93.3%), throat clearance (92.0%), hoarseness (60.0%), cough (58.6%), post nasal drip (53.3%), difficulty in swallowing (33.3%), choking (12.0%), annoying cough (5.3%) (Table 1). The reflux symptom index (RSI) was more than 13 on 41 patients with mean 13.28 ± 3.95

The reflux findings score (RFS) using fiber-optic laryngoscope was arytenoid erythema (86.6%), posterior commissure hypertrophy (84%), vocal cord oedema (33.3%), ventricular obliteration (18.6%), thick endolarynx sulcus (9.3%), pseudosulcus (6.6%), granuloma/granulation (2.6%), diffuse laryngeal oedema (2.6%) (Table 2). The reflux finding score was more than 7 on 23 patients with mean 6.43 ± 3.19 .

Table 1: Frequency and severity of various Symptoms in RSI (n=75)

| Symptoms | Scores, 0=no problem, 5= severe problem | | | | | |
|---|---|-----------|-----------|-----------|-----------|----------|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| Sensation of lump in the throat/globus | 2 (2.7) | 4 (5.3) | 6 (8.0) | 5 (6.7) | 55 (73.3) | 3 (4.0) |
| Heartburn, chest pain, indigestion/reflux | 5 (6.7) | 15 (20) | 40 (53.3) | 11 (14.7) | 4 (5.3) | 0 |
| Throat clearance | 6 (8.0) | 8 (10.7) | 10 (13.3) | 15 (20.0) | 28 (37.3) | 8 (10.7) |
| Hoarseness | 30 (40.0) | 18 (24.0) | 13 (17.3) | 10 (13.3) | 4 (5.3) | 0 |
| Coughing after eating or lying down | 31 (41.3) | 5 (6.7) | 22 (29.3) | 6 (8.0) | 8 (10.7) | 3 (4.0) |
| Post nasal drip or excess throat mucus | 35 (46.7) | 21 (28.0) | 11 (14.7) | 6 (8.0) | 2 (2.7) | 0 |
| Difficulty in swallowing food, liquids or pills | 50 (66.7) | 10 (13.3) | 4 (5.3) | 5 (5.7) | 6 (8.0) | 0 |
| Breathing difficulty or choking episodes | 66 (88.0) | 6 (8.0) | 2 (2.7) | 1 (1.3) | 0 | 0 |
| Annoying cough | 71 (94.7) | 3 (4.0) | 0 | 1 (1.3) | 0 | 0 |

Table 2: Frequencies of various Signs in RFS (n=75)

| Findings | Score | n (percent) |
|----------------------------------|----------------------|-------------|
| Erythema/hyperemia | 0=absent | 10(13.3%) |
| | 2=only in arytenoids | 60(80%) |
| | 4=diffuse | 5(7.6%) |
| Posterior commissure hypertrophy | 0=absent | 12(16%) |
| | 1=mild | 45(60%) |
| | 2=moderate | 17(22.6%) |
| | 3=severe | 1(1.3%) |
| | 4=obstruction | 0 |
| Vocal cord oedema | 0=absent | 50(66.6) |
| | 1=mild | 20(26.6%) |
| | 2=moderate | 3(4%) |
| | 3=severe | 2(2.6%) |
| | 4=obstruction | 0 |
| Ventricular obliteration | 0=absent | 61(81.3%) |
| | 2=partial | 14(18.6%) |
| | 4=complete | 0 |
| Thick endolarynx sulcus | 0=absent | 68(90.6%) |
| | 2=present | 7(9.3%) |
| Pseudosulcus | 0=absent | 70(93.3%) |
| | 2=present | 5(6.6%) |
| Granuloma/granulation | 0=absent | 73(97.3%) |
| | 2=present | 2(2.6%) |
| Diffuse laryngeal oedema | 0=absent | 72(96%) |
| | 1=mild | 3(4%) |
| | 2=moderate | 0 |
| | 3=severe | 0 |
| | 4=obstruction | 0 |

There was low correlation between RSI and RFS and it was statistically significant (Table 3)

Table 3: Pearson Correlation of RSI and RFS score

| Pearson Correlation | r-value | p-value |
|---------------------|---------|---------|
| RSI versus RFS | 0.2542 | 0.027 |

In this study, 4 patients had overt hypothyroidism and 2 patients had subclinical hypothyroidism. The overall incidence of hypothyroidism was 8% (Figure 1).

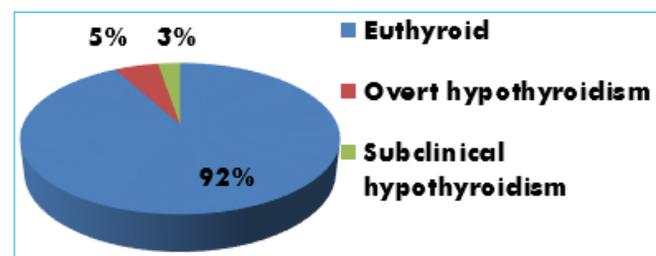


Figure 1: The prevalence of hypothyroidism

DISCUSSION

Laryngopharyngeal reflux affects 50% of the patients suffering from throat and vocal complains.⁸ Various studies described laryngeal symptoms and signs are possibly due to backflow of gastro duodenal contents in the upper aerodigestive tract.^{8,9,13-15}

In our study the presenting symptoms were globus (97.33%), heartburn(93.33%), throat clearance (92%), hoarsness (60%), coughing on lying/eating (58.66%),difficult in swallowing (55.55%), post nasal drip (53.33%), choking episode (12%), annoying cough (5.33%).Similarly a study done by Sharma et al shows globus (96.9%), throat clearance (96.9%) and heartburn (95.4%).¹⁰

In another study by Karakays et al hoarseness (98.2%) was the most common symptoms followed by throat clearance (92.7%), heartburn (86.3%).¹⁶ A study by Satish et al showed heartburn (79.2%), throat clearance (72.7%) and globus (71.6%) as the common symptoms.¹² Another study by Nunes et al the predominant symptoms was dry cough (40.4%) followed by globus (21.4%) and hoarsness (19.8%).³

In our study fiberoptic laryngoscopy findings was arytenoid erythema (86.6%), posterior commissure hypertrophy (84%), vocal cord oedema (33.3%),

ventricular obliteration (18.6%), thick endolarynx sulcus (9.3%), pseudosulcus (6.6%), granuloma/granulation (2.6%), diffuse laryngeal oedema (2.6%).

A study done by Sharma et al showed erythema arytenoids (100%) followed by vocal cord oedema (81.5%).¹⁰ Similarly Nunes et al observed arytenoid erythema followed by vocal cord oedema.³

In another study by Karakays et al observed vocal cord oedema (100%), posterior commissure hypertrophy (100%), erythema arytenoids (98.2%) which is in contrast than present study.¹⁶ In another study done by Satish et al the most common findings was erythema arytenoids (70.1%) followed by vocal cord oedema (15.6%).¹²

In our study RSI more than 13 was seen on 41 patients with Mean 13.28 ± 3.95 whereas RFS more than 7 was seen on 23 patients with mean 6.43 ± 3.19 . There was statistical correlation between RSI and RFS though the strength of correlation was low ($r = 0.2542$, $p = 0.027$). Similar to our study, a study done by Vazquez et al on 34 patients a significant low correlation was found between RSI and RFS ($r = 0.3$, $p = 0.007$).¹⁷

A study done by Sharma et al in 65 patients with laryngopharyngeal reflux showed moderate correlation between RSI and RFS ($r = 0.595$, $p = 0.000$).¹⁰ Another study done by M. Gelardi et al in 3932 patients with LPR also showed moderate correlation between RSI and RFS ($r = 0.484$, $p < 0.0001$).¹⁸ Mesallam and Stemple on 40 patients showed highly significant correlation between RFS and RSI ($r = 0.86$, $p < 0.0001$).¹⁹ A study by Satish et al showed no correlation between RSI and RFS ($p = 0.501$).¹²

It is well known that hypothyroidism leads to general as well as laryngeal symptoms. It causes significant changes in laryngeal tissue.^{7,20,21} A study done by Mohammad zadeh et al and Bicknell PG et al showed that the laryngeal manifestation in hypothyroidism patient is a change in voice.^{20,21} However, in our study the incidence of hypothyroidism was 8% which was similar to the incidence of hypothyroidism in general population of Nepal.²² All these patients had symptoms of hoarseness, globus and difficult in swallowing and vocal cord oedema in fiber-

optic laryngoscopy finding.

Our research has limitation, the post treatment (both with PPI and thyroid supplement) correlation between reflux index and reflux finding score has not done in our study.

CONCLUSION:

There was correlation between reflux symptom index and reflux finding score. RSI and RFS due to its low cost and high practicality can be easily included as objective parameters in ENT department. Similarly, laryngeal manifestations of hypothyroidism may mask LPR hence specialist can evaluate the need for further tests.

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