Assessment of treatment response in patients with laryngopharyngeal reflux

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Abstract To evaluate treatment response in patients with laryngopharyngeal reflux (LPR). A prospective study of 100 patients with voice disorders was conducted. Patients were evaluated using reflux symptom index (RSI) and reflux finding score (RFS) by 70° rigid laryngoscope. Patients with RFS score of 7 or more were diagnosed of having LPR and were started with anti-reflux therapy for a period of 6 months. Patients were assessed at regular intervals using RSI and RFS. The prevalence of LPR in patients with voice disorders was found to be 25%. The mean RSI score improved gradually and significantly over a period of 6 months from 11.84 at presentation to 2.04 after 6 months of treatment (p value <0.001). The mean value of RFS improved from 7.92 at entry to 1.52 after 6 months of treatment (p value <0.001). However, it was found that the improvement was not significant at end of first month of treatment, and improvement in RSI and RFS scores was found only after 2 months of treatment. RSI and RFS improve significantly after treatment for 6 months with PPI like Omeprazole. But the improvement starts from the 2nd month from the onset of treatment. Treatment of LPR for at least 6 months may be indicated to attain a full resolution of physical findings.

Keywords Laryngopharyngeal reflux · Reflux finding score · Reflux symptom index

Introduction

Laryngopharyngeal reflux (LPR) is laryngeal manifestation of Gastroesophageal reflux. The prevalence of reflux in patient with voice disorders is increasing. The symptoms and manifestations of LPR include dysphonia, Globus sensation, cough, subglottic stenosis, muscle tension dysphonia, laryngospasm, vocal process granuloma, asthma, and possibly chronic sinusitis, laryngeal carcinoma. The treatment options available to patients with LPR include combinations of dietary and behavior modification, antacids, H₂-receptor antagonists, proton pump inhibitors, and fundoplication surgery.

Unlike with GERD, response to PPI therapy in patients with LPR has been described as highly variable [1]. This is in part because LPR requires more aggressive and prolonged therapy than GERD [2]. Our goal was to determine treatment response in patient with LPR.

Aims and Objectives

- To evaluate treatment response in patients with LPR disease.

Methods and Materials

In this study, 100 patients of voice disorders who presented to E.N.T. OPD from July 2011 to August 2013 were included. Children and adolescents below 18 years of age, cases of paralytic dysphonia, suspected laryngeal malignancies and trauma were excluded. Thorough detailed history including age, gender, occupation, tea/coffee intake

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Table 1 Comparison of RSI Total Score at various time intervals

RSI total ^a	Mean	SD	Median	IQR	Chi square	<i>p</i> value
At presentation	11.84	5.01	13.00	7.50	95.942	7.19E–20
1 month	9.08	3.92	9.00	6.50	Difference is significant	
2 months	5.60	2.83	5.00	5.50		
3 months	3.76	2.19	4.00	3.50		
6 months	2.04	1.81	2.00	3.00		
Comparison pairs		Difference of Ranks		Q-value	<i>p</i> value	Difference is
All pairwise multiple comparison procedures (Tukey Test)						
At presentation versus 1 month		17.000		2.150	>0.05	Not significant
At presentation versus 2 months		49.500		6.261	≤0.05	Significant
At presentation versus 3 months		71.000		8.981	≤0.05	Significant
At presentation versus 6 months		92.500		11.700	≤0.05	Significant

^a Friedman Repeated Measures ANOVA on Ranks applied

(more than 2 cups/day), history of addiction, food habits (like spicy or bland food) and sleep (sleep less than 6 h) was taken.

Reflux symptom index (RSI) score was calculated for all patients in the study. General and physical examination was done for all patients. All patients were evaluated with 70° Hopkins rigid laryngoscope. Findings were noted and scored according to reflux finding score (RFS).

All patients were classified into two groups using RFS; those patients in whom RFS were less than 7 were labeled as ‘Others’, while those patients with RFS 7 or more than 7 were labeled as ‘LPR’. Diagnosis of LPRD was done on the basis of RFS as validated by Belafsky et al. [3]. Patients in LPR group were then started with anti-reflux therapy in the form of proton pump inhibitor i.e. Omeprazole in the dose of 20 mg BID on empty stomach for a period of 6 months. This treatment was combined with strict dietary modification, stress management and regularization of lifestyle.

The patients of LPR group were then followed up at an interval of 1, 2, 3 and 6 months. Follow up visit consisted of assessing the RSI, Voice handicap index and RFS by 70° rigid laryngoscope.

Results

Out of the 100 patients enrolled with voice disorders, there were 25 patients whose RFS was 7 or more than 7 (LPR group) and 75 patients whose RFS was less than 7 (Others).

Demographic study showed maximum patients were in age group of 25–44 years (70%) followed by 45–64 years (27%). The mean age was 41.48 years. 54% patients were female and 46% were male.

For all patients in LPR group, total mean values of RSI and RFS were recorded at presentation and after 1st, 2nd, 3rd and 6th months of starting treatment to monitor response to treatment and pattern in which response had occurred.

The mean value of RSI at entry was 11.84. This score improved to 9.08 at 1 months, 5.60 at 2 months, 3.76 at 3 months and 2.04 at 6 months of treatment. Thus it can be seen that the RSI score has improved significantly over a period of 6 months (p value <0.001). However, the improvement was not significant over the first 1 month of treatment and to get significant improvement in RSI score the treatment should be continued for at least 2 months. The maximum improvement in RSI score is achieved at the end of 6 months. (Table 1) (Fig. 1).

The mean value of RFS at entry was 7.92. This score improved to 5.80 at 1 months, 3.84 at 2 months, 2.60 at 3 months and 1.52 at 6 months of treatment. Thus it can be seen that the RFS score has improved significantly over a period of 6 months (p value <0.001). However, the improvement was not significant over the first 1 month of

Fig. 1 RSI total score at various time intervals

Table 2 Comparison of RFS Total Score at various time interval

RFS total ^a	Mean	SD	Median	IQR	Chi Square	<i>p</i> value
At presentation	7.92	1.19	8.00	1.00	95.364	9.54E−20
1 month	5.80	1.23	5.00	2.00	Difference is significant	
2 months	3.84	1.38	4.00	2.00		
3 months	2.60	1.26	2.00	1.00		
6 months	1.52	0.92	1.00	1.00		
Comparison pairs		Difference of ranks		Q-value	<i>p</i> value	Difference is
All pairwise multiple comparison procedures (Tukey Test)						
At presentation versus 1 month		23.500		2.973	> 0.05	Not significant
At presentation versus 2 months		52.000		6.578	<= 0.05	Significant
At presentation versus 3 months		76.000		9.613	<= 0.05	Significant
At presentation versus 6 months		93.500		11.827	<= 0.05	Significant

^a Friedman Repeated Measures ANOVA on Ranks applied

Fig. 2 RFS total score at various time intervals

treatment and to get significant improvement in RFS score the treatment should be continued for at least 2 months. The maximum improvement in RFS score is achieved at the end of 6 months. (Table 2) (Fig. 2).

Discussion

There has been a steep rise in the prevalence of LPR diseases because of constantly changing modern lifestyle. Patients with LPR should be educated as to the nature of their disease and counseled on lifestyle modifications and dietary changes [4]. Important behavioral changes include weight loss, smoking cessation, and alcohol avoidance. Ideal dietary changes would restrict chocolate, fats, citrus fruits, carbonated beverages, spicy tomato-based products, red wines, caffeine, and late-night meals. Such behavioral changes appear to be an independently significant variable in determining response to medical therapy [5].

Along with advice on lifestyle and dietary modifications, most of the patients will require some form of medical therapy. The aim of the medical management of

LPR is neutralisation of the gastric juice acidity and the enhancement of gastrointestinal tract motility. Treatment with proton pump inhibitors (PPI) is required for the resolution of laryngeal symptoms and physical findings of patients with LPR.

In our study, mean RSI score has improved from 11.84 at presentation to 2.04 after 6 months of treatment (p value <0.001) which is statistically significant. This correlates with the findings by Habermann et al. [6] in which they found that the mean RSI improved from 13.8 to 4.9 (p value <0.001). Similarly, mean RFS score has improved from 7.92 at presentation to 1.52 after 6 months of treatment (p value <0.001) which is statistically significant. This correlates with the study by Belafsky et al. [3] which shows statistically significant improvement in mean RFS score post-treatment.

However, mean RSI and RFS were not found to differ significantly after 1 month of treatment (p value >0.05). Thus suggesting that larynopharyngeal symptoms and findings changed after 2 months of therapy and this correlates with a study by Rouev et al. [7] where they found that larynopharyngeal symptoms and laryngoscopic findings changed after 2 months of treatment. Symptom resolution of straightforward LPR usually takes place within 2 months of therapy with PPI. Nonetheless, the objective findings of LPR recover more slowly and continue to get better for the period of 6 months of treatment [8]. Voice disorders may have numerous causes. Therefore, the lack of ability of proton pump inhibitors to entirely resolve the symptoms or physical findings is likely. Treatment of LPR of more than 6 months may be indicated to attain a full resolution of physical findings and to reduce the risk of the return of symptoms. Termination of treatment based on the presumption that LPR symptoms are getting better alone may be premature. This conclusion concurs with the view

of the Consensus Conference Report on LPR (1997) [9] that suggested twice daily PPI treatment be continued for a minimum period of 6 months.

In one prospective, placebo-controlled, randomized, double-blind study, the laryngoscopic findings and laryngopharyngeal symptoms in reflux laryngitis showed improvement through antireflux treatment with omeprazole [10].

Besides the nature of treatment, the dosage and duration of treatment is also of great interest.

Conclusion

RSI and RFS improve significantly after treatment for 6 months with PPI like Omeprazole. But the improvement starts from the 2nd month from the onset of treatment. Termination of treatment based on the presumption that LPR symptoms are getting better alone may be premature. Treatment of LPR of more than 6 months may be indicated to attain a full resolution of physical findings and to reduce the risk of the return of symptoms.

Compliance with Ethical Standards

Conflict of interest All Authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

1. Vaezi MF (2003) Extraesophageal manifestations of gastroesophageal reflux disease. *Clin Cornerstone* 5:32–38
2. Park W, Hicks DM, Khandwala F et al (2005) Laryngopharyngeal reflux: prospective cohort study evaluating optimal dose of proton-pump inhibitor therapy and pretherapy predictors of response. *Laryngoscope* 115:1230–1238
3. Belafsky PC, Postma GN, Koufman JA (2001) The validity and reliability of the reflux finding score (RFS). *Laryngoscope* 111(8):1313–1317
4. Katz PO, Castell DO (2000) Medical therapy of supra-esophageal gastroesophageal reflux disease. *Am J Med* 108(suppl 4a):170S–177S
5. Steward DL, Wilson KM, Kelly DH et al (2004) Proton pump inhibitor therapy for chronic laryngopharyngitis: a randomized placebo-control trial. *Otolaryngol Head Neck Surg* 131:342–350
6. Habermann W, Schmid C, Neumann K, Devaney T, Hammer HF (2012) Reflux symptom index and reflux finding score in otolaryngologic practice. *J Voice* 26(3):e123–e127
7. Rouev P, Chakarski I, Doskov D, Dimov G, Staykova E (2005) Laryngopharyngeal symptoms and gastroesophageal reflux disease. *J Voice* 19(3):476–480
8. Belafsky PC, Postma GN, Koufman JA (2001) Laryngopharyngeal reflux symptoms improve before changes in physical findings. *Laryngoscope* 111(6):979–981
9. Koufman J, Sataloff RT, Toohill R (1996) Laryngopharyngeal reflux: consensus conference report. *J Voice* 10(3):215–216
10. Noordzij JP, Khidr A, Evans BA, Desper E, Mittal RK, Reibel JF et al (2001) Evaluation of omeprazole in the treatment of reflux laryngitis: a prospective, placebo-controlled, randomized, double-blind study. *Laryngoscope* 111(12):2147–2151