



CLINICAL STUDY

VOICE QUALITY IN CHRONIC LARYNGITIS

Tolga KANDOĞAN, MD

İzmir Training and Research Hospital, Clinic of Otorhinolaryngology, İzmir, Turkey

SUMMARY

In this study, the voice quality of the chronic laryngitis patients have been evaluated. 21 chronic laryngitis patients, 18 males and 3 females, aged between 22 and 64 years old were included to the study. All of them were smoker, and in 12 of them, laryngopharyngeal reflux were present. Control group consist of 74 volunteers, 67 males and 7 females. 49 of them were smokers, and in 16 of them, laryngopharyngeal reflux were present. The diagnosis of chronic laryngitis was established by videolaryngoscopy using a 70° rigid scope. Auditive and acoustic analysis, voice range profile, maximum phonation time and the Disphonia Severity Index (DSI) were measured. Statistical analysis was performed using paired sample T-Test. There was a statistically significant difference in RBH and DSI scores of the control and chronic laryngitis groups. The voice quality is slightly-moderately disturbed in chronic laryngitis patients, objectively and subjectively.

Keywords: Voice, chronic, laryngitis, acoustic analysis

KRONİK LARENJİTLİ HASTALARDA SES KALİTESİ

ÖZET

Bu çalışmada kronik larenjitli hastaların ses kalitesi araştırılmıştır. Yaşları 22 ile 64 arasında değişen, 18'i erkek 3'ü kadın olmak üzere 21 hasta çalışmaya alınmıştır. Hastaların tamamı sigara kullanıcısıdır, ve 12 tanesinde laringofarengeal reflü bulguları mevcut idi. Kontrol grup ise 67'si erkek 7'si kadın olmak üzere 74 kişiden oluşmaktaydı. Bunlardan 49 tanesi sigara içicisiydi ve 16 tanesinde laringofarengeal reflü bulguları mevcut idi. Kronik larenjit teşhisi 70° endoskop ile konmuştur. İşitsel ve akustik analizler, ses alanı, maksimum fonasyon süresi ve disfoni şiddet endeksi hesaplanmıştır. İstatistiksel analizde T Test kullanılmıştır. Kontrol ve kronik larenjitli hasta gruplarında, RBH ve DSI skorları arasında istatistiksel olarak anlamlı bir fark çıkmıştır. Sonuç olarak gerek objektif gerekse subjektif değerlendirme sonuçlarına göre kronik larenjitli hastalarda ses kalitesinin hafif-orta derecede bozulduğunu söyleyebiliriz.

Anahtar Sözcükler: Ses, kronik larenjit, akustik analiz

INTRODUCTION

Chronic laryngitis is an chronic inflammation of the larynx. It may result from gastroesophageal reflux disease, infections, exposure to toxic agents such as tobacco, alcohol, voice abuse, allergy and systemic diseases. Chronic laryngitis refers to irreversible alterations of the laryngeal mucosa, eg. thickening of the vocal folds. Chronic laryngitis may lead to tissue changes, such as nodules, polyps, or hypertrophy of the laryngeal epithelium¹.

Although other symptoms such as discomfort and dryness in the throat are also present in patients with chronic laryngitis, the most prominent symptom is marked roughness and hoarseness of the voice.

In this study, the voice quality of the chronic laryngitis patients have been evaluated.

MATERIAL and METHODS

21 chronic laryngitis patients, 18 males and 3 females, aged between 22 and 64 years old were included to the study. The mean age was 46 years. All of them were smoker, 10-40/day. In 12 of them, laryngopharyngeal reflux were present according to Reflux Finding Score². (Table 1)

Control group consist of 74 volunteers, 67 males and 7 females, aged between 19 and 67 years. The mean age was 41 years. 49 of them were smokers, 5-20/day, In 16 of them, laryngopharyngeal reflux were present according to Reflux Finding Score.

The diagnosis of chronic laryngitis was established by videolaryngoscopy using a 70° rigid scope (Karl Storz, Tuttlingen, Germany).

RBH (Auditive analysis)

Roughness(R), breathiness(B), and hoarseness(H) were estimated by the author with the patients reading a passage from the turkish text "Kasagi" by Omer Seyfettin. These parameters are estimated as 0 = normal or absent deviance, 1 = slight deviance, 2 = moderate deviance, 3 = severe deviance.

Corresponding Author: Tolga KANDOĞAN MD; Sağlık Bakanlığı, KBB, İzmir, Türkiye, Telephone: +90 232 4651488 Faks: +90 232 2614444 E-mail: tkandogan@yahoo.com

Received: 4 March 2006, accepted for publication: 8 April

Subglottic Edema	2 = present 0 = absent
Ventricular Obliteration	2 = partial 4 = complete
Erythema/Hyperemia	2 = arytenoid only 4 = diffuse
Vocal Cord Edema	1 = mild 2 = moderate 3 = severe 4 = polypoid
Diffuse Laryngeal Edema	1 = mild 2 = moderate 3 = severe 4 = obstructing
Posterior Commissure Hypertrophy	1 = mild 2 = moderate 3 = severe 4 = obstructing
Granuloma/Granulation	2 = present 0 = absent
Thick Endolaryngeal mucus	2 = present 0 = absent

Table 1. Reflux Finding score

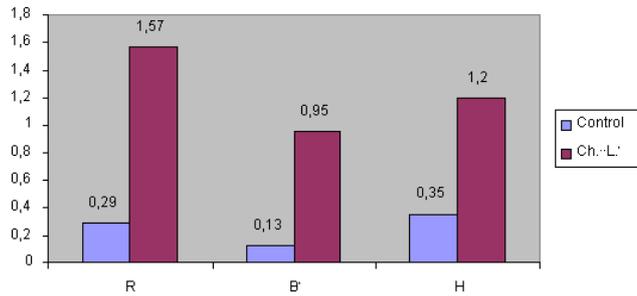


Table 2. The comparison of the mean values of RBH auditory analysis scores in control, and chronic laryngitis group.

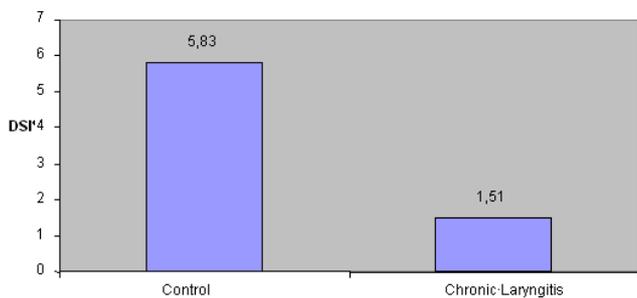


Table 3. The comparison of mean values of DSI scores in control and chronic laryngitis patients.

Acoustic analysis

Analysis of jitter (%) allows the relative evaluation of the period-to-period variability of the pitch within the analyzed voice sample. These parameter were analyzed on a sustained /a:/ using the

Multi Dimensional Voice Program (MDVP) with the Computerized Speech Lab CSL 4300B (Kay Elemetrics Ltd., Lincoln Park, NJ, USA).

Voice Range Profile (VRP)

Voice range profile identifies the minimal I(low) and maximal amplitude and the lowest and highest frequency F0(high) of the voice range. Measured with Computerized Speech Lab CSL 4300B (Kay Elemetrics Ltd., Lincoln Park, NJ, USA)

Maximum Phonation Time (MPT)

MPT is the simplest aerodynamic parameter of phonation in seconds. This parameter was measured on a sustained /a:/ after full inspiration in a comfortable loudness.

Disphonia Severity Index (DSI)

In assessing the dysphonia severity, the formula

$$[DSI=0.13 \times MPT + 0.0053 \times F0(\text{high}) - 0.26 \times I(\text{low}) - 1.18 \times \text{jitter}(\%) + 12.4]$$
 is used³.

These examinations were performed as recommended by the Union of European Phoniaticians (UEP)⁴. Statistical analysis was performed using paired sample T-Test.

RESULTS

There was a statistically significant difference (p=0) in RBH and DSI scores of the control and chronic laryngitis groups. (Table 2 and 3)

DISCUSSION

Dysphonia is a prominent symptom in all patients with clinically significant chronic laryngitis. In addition to dysphonia, patients often complain of discomfort, dryness in the throat, and in advanced cases, vocal fatigue and increased effort with phonation.

In chronic laryngitis, the stiffness of the vocal folds is increased, with little effect on the mass of the vocal folds. It is marked by thickened epithelium. The vocal folds will become dry and sticky, and a chronic cough may be present as the system attempts to remove the thick secretions on the vocal folds. The vocal folds may show increased asymmetry and aperiodicity, with reduced mucosal waves and reduced amplitude. Chronic laryngitis is marked with greater than normal frequency and amplitude perturbation. The fundamental frequency may be elevated or reduced. This may be related to the severity of the cordal involvement¹. If the tissue changes prevents the complete closure of the vocal folds, a breathy phonation may also result.



As it was shown in table 2 and 3, the voices of the chronic laryngitis patients were statistically significant different from the control group. In the subjective evaluation of voice, eg. RBH system, the mean values are (1,57), (0,95) and (1,2) respectively. As mentioned in the material and method section, these parameters eg. RBH are estimated as 0 = normal or absent deviance, 1 = slight deviance, 2 = moderate deviance, 3 = severe deviance. So the chronic laryngitis groups voices are between 1 and 2, close to moderate deviance. Their mean DSI score was in accordance with RBH score, eg. 1,51. According to this findings, it could be said, that the voice quality of the chronic laryngitis group was slightly-moderately deviated from normal.

CONCLUSION

The voice quality is slightly-moderately disturbed in chronic laryngitis patients, objectively and subjectively.

REFERENCES

1. Colton RH, Casper JK. Voice misuse and abuse in : Understanding voice problems. Williams & Wilkins Company, New York 2th edition. 1996 Pages: 78-111
2. Belafsky PC, Postma GN, Koufman JA. The validity and reliability of the reflux finding score (RFS). Laryngoscope. 2001;111(8):1313-7. PMID: 11568561
3. Wuyts FL, Molenberghs G, Remacle M, Heylen L, Millet B, Van Lierde K, Raes J, Van de Heyning PH. The Dysphonia Severity Index: An Objective Measure of Vokal Quality Based on a Multiparameter Approach. Journal of Speech, Language, and Hearing Research 2000;43:796-809 PMID: 10877446
4. Schutte HK, Seidner W. Recommendation by the Union of European Phoniaticians (UEP): Standardizing voice area measurement/phonetography. Folia phoniatr. 1983;35:286-288 PMID: 6654278