

ARAŞTIRMA / RESEARCH ARTICLE

Voice change: a differential diagnostic sign for leukoplakia?

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Ses değişikliği: lökoplazi için ayırıcı tanısal belirti

Amaç: Bu çalışmada lökoplazideki akustik değişiklikler ile lökoplazi ve kronik larenjit arasındaki akustik benzerlikler araştırılmış ve bunlar ses bozukluğu olmayan kontrol grubu ile karşılaştırılmıştır.

Yöntem: Yaşları 21 ile 64 arasında değişen, 23'ü erkek 3'ü kadın olmak üzere 26 kronik larenjit hastasıyla, yaşları 44 ile 67 arasında değişen, 22'si erkek, biri kadın 23 lökoplazi hastası çalışmaya dahil edilmiştir. Hastaların tamamı 70° endoskop ile muayene edilmiştir. Endoskopik bulguların ışığı altında, tüm lökoplazi grubu hastalarından genel anestezi altında biyopsi alınmıştır. Kontrol grubunu ise ses bozukluğu olmayan 67'si erkek, 13'ü kadın, 80 gönüllü oluşturmaktaydı. İşitsel ve akustik analiz, ses alanı, maksimum fonasyon süresi ve disfoni şiddet endeksi hesaplanmıştır. İstatistiksel analiz için t test ve ANOVA kullanılmıştır.

Bulgular: Kontrol grubu ile kronik larenjit grubu arasında ve kontrol grubu ile lökoplazi grubu arasında RBH ve DSI skorları için istatistiksel olarak anlamlı farklar mevcuttur. RBH ve DSI skorları için kronik larenjit ve lökoplazi grupları arasında istatistiksel olarak anlamlı fark yoktur.

Sonuç: Bu bulgular ışığında, lökoplazi için objektif veya sübjektif ses değişiklikleri diagnostik ayırıcı bir değer taşımamaktadır. Kronik larenjit ve lökoplazinin ses kaliteleri benzer özellikler taşımaktadır.

Anahtar Sözcükler: Kronik larenjit, lökoplazi, ses.

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Abstract

Objectives: In this study, the acoustic changes in leukoplakia and acoustic similarities between leukoplakia and chronic laryngitis were investigated and they are compared with nondysphonic control group.

Methods: 26 chronic laryngitis patients, 23 males and 3 females, aged between 21 and 64 years old and 23 patients with leukoplakia, 22 males and 1 female, aged between 44 and 67 years old were included to the study. All of the patients were examined with videolaryngoscopy using a 70° rigid scope. In the light of the endoscopic findings of the leukoplakia group, incisional biopsy was taken from the vocal fold under general anesthesia from all of them. Control group consist of 80 nondysphonic volunteers, 67 males and 13 females. 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 and ANOVA.

Results: There was a statistically significant difference in Roughness, Breathiness and Hoarseness (RBH) and DSI scores between control group-chronic laryngitis and control group-leukoplakia group. There was not a statistically significant difference in RBH and DSI scores between chronic laryngitis and leukoplakia group.

Conclusion: In the light of these findings, the voice change, objectively and subjectively, is not a differential diagnostic sign for leukoplakia. The voice qualities of chronic laryngitis and leukoplakia group were similar.

Key Words: Chronic laryngitis, leukoplakia, voice.

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Introduction

Leukoplakia is an epithelial lesion, in which there is an abnormal tissue growth on the vocal folds. They are flat, white, plaque like lesions. Full spectrum of premalignant tissue changes are observed in these lesions and they must be carefully monitored.¹

Smoking, environmental pollutants, gastroesophageal reflux disease have been implicated in the development of leukoplakia. The lesions may be unilateral or bilateral and are usually asymmetric. The glottal edge is rough.

In this retrospective study, the acoustic changes in leukoplakia and acoustic similarities between leukoplakia and chronic laryngitis were investigated and they are compared with nondysphonic control group.

Materials and Methods

26 chronic laryngitis patients, 23 males and 3 females, aged between 21 and 64 years old were included to the study. The mean age was 45 years. All of them were smoker, 10-40/day. In 19 of them, laryngopharyngeal reflux were present according to Reflux Finding Score.² 23 patients with leukoplakia, 22 males and 1 female, aged between 44 and 67 years old were included to the study. All of them were smoker. In 20 of them, laryngopharyngeal reflux was present according to Reflux Finding Score. All of the patients were examined with videolaryngoscopy using a 70° rigid scope (Karl Storz, Tuttlingen, Germany) and in the light of the endoscopic findings, incisional biopsy was taken from the vocal fold under general anesthesia from all of them. Control group consist of 80 nondysphonic volunteers, 67 males and 13 females, aged between 19 and 67 years. 52 of them were smokers, 5-20/day, In 18 of them, laryngopharyngeal reflux were present according to Reflux Finding Score.

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 "Kaşığı" by Ömer Seyfettin. These parameters are estimated as 0=normal or absent deviance, 1=slight deviance, 2=moderate deviance, 3=severe deviance.

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= 0.13xMPT+0.0053xF0(high)-0.26xI(low)-1.18xjitter(%)+12.4] is used.³

These examinations were performed as recommended by the Union of European Phoniaticians (UEP).⁴ Statistical analysis was performed using paired sample t-test and analysis of variance (ANOVA).

Results

There was a statistically significant difference ($p=0$) in RBH and DSI scores between control group-chronic laryngitis and control group-leukoplakia group. There was not a statistically significant difference in RBH ($p=0.124$) and DSI ($p=0.217$) scores between chronic laryngitis and leukoplakia group (Figures 1 and 2).

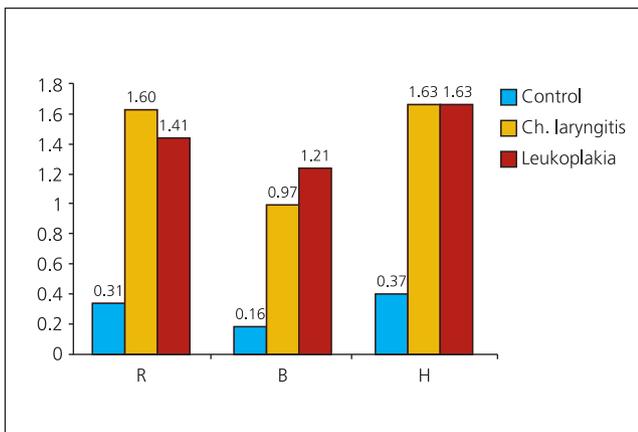


Figure 1. The comparison of the mean values of RBH auditory analysis scores in control, chronic laryngitis and leukoplakia group. [Color figure can be viewed in the online issue, which is available at www.turkarchotolaryngol.org]

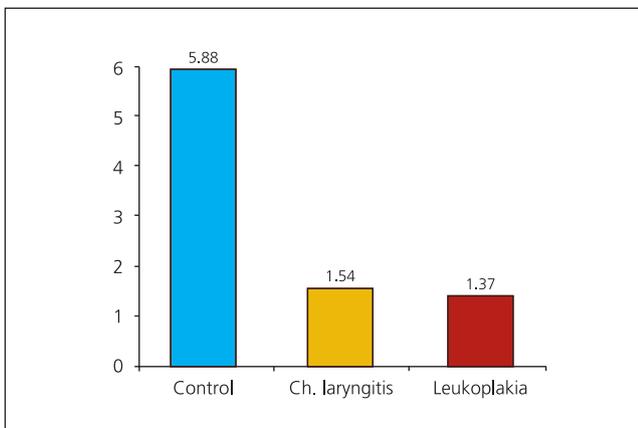


Figure 2. The comparison of mean values of DSI scores in control, chronic laryngitis and leukoplakia patients. [Color figure can be viewed in the online issue, which is available at www.turkarchotolaryngol.org]

Discussion

All patients with clinically significant chronic laryngitis present with some degree of dysphonia.⁵ Chronic laryngitis affects the cover of the vocal folds by increasing its stiffness, with little effect on the mass of the vocal folds. It is marked by thickened epithelium. 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 involvement.⁶ Chronic laryngitis leads to hoarseness, roughness and sometimes also breathiness, if the complete closure of the vocal folds is impaired.

In leukoplakia, vocal fold edges will be rough and result in an irregularly shaped glottic chink on vocal fold closure. In early and superficial cases, it is possible, that the mucosal wave is not disturbed. In leukoplakia, due to the growths on the vocal folds, greater than normal frequency and amplitude perturbation as well as greater than normal spectral voice will be expected.¹ Similar acoustic differences could be expected both in chronic laryngitis and leukoplakia, objectively and subjectively.

In our study it was cleared, that the voices of the chronic laryngitis and leukoplakia group are not statistically significant different from each other.

The mean roughness (R), breathiness (B) and hoarseness (H) values of the chronic laryngitis patients are (1.60), (0.97) and (1.63) respectively. Leukoplakia group has a similar scores, (1.41), (1.21) and (1.63). Their voices are between 1 and 2, close to moderate deviance. Their mean DSI scores are 1.54 and 1.37 respectively, also in accordance with their RBH scores.

This findings confirm that the voice change is not a differential diagnostic sign for leukoplakia. The voice qualities of chronic laryngitis and leukoplakia group were similar.

Conclusion

The voice quality of leukoplakia is not different from chronic laryngitis and it is not a differential diagnostic sign for leukoplakia.

References

1. **Colton RH, Casper JK.** Voice problems associated with organic disease, trauma and the geriatric voice. In: Colton RH, Casper JK, editors. Understanding voice problems. 2th ed. New York: Williams & Wilkins Company; 1996. p. 164-85.
2. **Belafsky PC, Postma GN, Koufman JA.** The validity and reliability of the reflux finding score (RFS). *Laryngoscope* 2001; 111: 1313-7.
3. **Wuyts FL, Molenberghs G, Remacle M, et al.** The dysphonia severity index: an objective measure of vocal quality based on a multiparameter approach. *J Speech Lang Hear Res* 2000; 43: 796-809.
4. **Schutte HK, Seidner W.** Recommendation by the Union of European Phoniaticians (UEP): standardizing voice area measurement/phonetography. *Folia Phoniatr* 1983; 35: 286-8.
5. **Kandođan T.** Voice quality in chronic laryngitis. *KBB Forum* 2006; 5: 66-8.
6. **Colton RH, Casper JK.** Voice misuse and abuse. In: Colton RH, Casper JK, editors. Understanding voice problems. 2th ed. New York: Williams & Wilkins Company; 1996. p. 78-111.

Conflict of interest statement:

No conflicts declared.

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