TREATMENT OF PATIENTS WITH CHRONIC TONSILLITIS AGAINST THE BACKGROUND OF FUNCTIONAL DYSPHONIA

Khasanov U.S., Abdullaeva N.N.,
Makhamadaminova Sh.A., Ergashev U.M.,
Akhunjonov D.M.
Tashkent Medical Academy

Abstract. The vocal tract consists of three systems: aerodynamic (lungs), vibratory (vocal folds) and resonator (upper - nasal cavity, paranasal sinuses, oral cavity, pharynx; lower - trachea, bronchi, lungs, chest). Any disease immediately leaves an imprint on the strength, timbre and pitch of the voice. One of the common causes of functional dysphonia in patients is untimely treatment of the disease in the acute stage and its transition to chronic, Chronic tonsillitis is a striking example. It is known that the problem of chronic tonsillar pathology has remained relevant for many decades and continues to occupy one of the leading places in the pathology of ENT organs. The problem of chronic tonsillitis at the present stage is becoming increasingly relevant due to the growth of tonsillogenic pathology of both local and systemic nature. WHO statistics show that 10-15% of the adult population worldwide suffers from chronic tonsillitis, primarily people of working age. Thus, according to various authors, 5-6% of the adult population suffers from chronic tonsillitis. According to other estimates, the incidence of chronic tonsillitis in various age groups ranges from 22% to 40%.

Keywords: chronic tonsillitis, speech, dysphonia, trachea.

Introduction. The voice plays a huge communicative role in our lives, and in the professional activities of people for whom the voice and speech are the "tool" of their work, voice formation disorders can lead to temporary or permanent disability. The vocal tract includes three systems: aerodynamic or energy (lungs), vibratory (vocal folds) and resonant (upper and lower resonators). All components of the vocal tract must interact harmoniously with each other and with the central nervous system in order to form voice and speech [1].

Being part of the resonant section of the vocal apparatus, the palatine tonsils affect voice and speech. It is assumed that this effect is due to two reasons. Firstly, the palatine tonsils affect resonance in the vocal tract by volumetric action [2]. Secondly, the palatine tonsils can affect resonance along with articulation due to their tissue characteristics [3]. According to modern concepts, chronic tonsillitis is characterized as a multifactorial immuno-pathological process that can contribute to the development of local and systemic complications with the development of cardiovascular,

neuroendocrine, immunological and metabolic syndromes [4].

In modern clinical practice, up to 80 metatonsillar diseases are known [5]. However, the question of the impact of chronic tonsillitis on voice function has not yet found its final solution [6, 7].

The main objective acoustic parameters include: maximum phonation time (MPT), fundamental frequency (FFT, denoted as F0), Jitter - the degree of frequency instability of the fundamental tone, Shimmer - the degree of amplitude instability of the fundamental tone, dysphonia index (DSI) - an indicator of a comprehensive assessment of the acoustic parameters of the voice - and others [2, 8]. In the subjective assessment of the functional state of the vocal apparatus, the Voice Handicap Index (VHI), Voice-Related Quality Of Life (VRQOL) questionnaires and their various modifications, as well as the GRBAS scale, are widely used [8].

Among the causes of functional voice disorders in chronic tonsillitis are disorders of the neuroreflex mechanisms, changes in the volume of the oropharyngeal resonator, changes in the local and general immunological reactivity of the body [9]. Pain that occurs with tonsillopharyngitis prevents the complex motor act performed by the pharynx from being fully performed. In addition, the inflammatory process in the mucous membrane disrupts the normal functioning of the receptor elements of the trigeminal, glossopharyngeal and vagus nerves, as a result of which changes occur both in the timbre and in the normal vibration mode of the vocal folds [10]. Domestic authors provide data on the presence of laryngeal pathology in patients with chronic tonsillitis from 20–25% to 84–92.5% of cases [9, 11, 12]. Thus, the problem of studying the influence of chronic tonsillitis on the clinical and functional state of the larynx remains relevant. The purpose of the study is to improve the efficiency of diagnostics of functional disorders of the vocal apparatus in patients with chronic tonsillitis.

Material and methods. The study included 40 people of vocal and speech professions from 18 to 58 years old (12 men and 28 women) with a simple form of chronic tonsillitis or chronic tonsillitis TAF 1, who came with complaints of discomfort in the oropharynx, periodic discharge of caseous-purulent plugs from the lacunae of the palatine tonsils, periodic hoarseness, rapid fatigue of the voice, accumulation of mucus in the laryngopharynx. The study did not include patients with anomalies and injuries of the facial skull, with a burdened history of gastroesophageal reflux disease, with any form of hearing loss, with psychoneurological diseases, patients who had previously undergone tonsillotomy, adenotomy, patients who had ever undergone voice and speech correction. The patient examination schedule included a thorough anamnesis, general otolaryngological and phoniatric examinations, and an assessment of the functional state of the vocal apparatus using acoustic voice analysis, video laryngostroboscopy, and a specialized VHI questionnaire.

Video laryngostroboscopy: an EndoSTROB-XION electronic stroboscope with the following technical characteristics was used to assess the phonatory vibrations of the vocal folds: 90-240V, 50-60Hz, 150W, 2.5A. For an objective characterization of the laryngostroboscopic picture, a scoring system for assessing the phonatory vibrations of the vocal folds according to Ivanchenko GF [13] was used. The main parameters of the laryngostroboscopic picture were assessed: 1. The presence of vocal fold vibrations:

- preserved on both sides – 1 point,
- preserved on one side – 2 points,
- absent on both sides – 3 points.

2. Change in the frequency (regularity) of oscillations, i.e. synchronicity:

- synchronous, uniform oscillations – 1 point,
- one vocal fold oscillates with a lower frequency than the other – 2 points,
- chaotic, irregular oscillations – 3 points

3. Change in the amplitude of oscillations:

- same amplitude of vocal folds – 1 point,
- disorder on one side – 2 points,
- bilateral disorder – 3 points.

4. Change in the phase of glottal closure:

- complete closure of the glottis – 1 point,
- incomplete closure of the glottis – 2 points,
- constant lack of closure of the glottis – 3 points.

5. Change in the opening phase:

- the edges of the vocal folds are moderately and evenly concave – 1 point,
- the vertical component is enlarged or absent – 2 points,
- different levels of the vocal folds – 3 points.

The total number of points scored was divided by 5 and the vibratory insufficiency index was calculated. The normal value is 1 point [13].

The vocal tract includes three systems: aerodynamic or energy (lungs), vibratory (vocal folds) and resonator (upper and lower resonators)

Chronic tonsillitis is characterized as a multifactorial immunopathological process that can contribute to the development of local and systemic complications with the development of cardiovascular, neuroendocrine, immunological and metabolic syndromes.

Computer acoustic analysis of the voice: the voice was recorded using the LingWAVES 30 program and a sound level meter from the German company WEVOSYS. According to the instructions for the recording equipment used, the voice recording was performed in a quiet room (the level of extraneous noise was below 40-45 dB) on a personal computer with the Windows 80 operating system, with an E-350

processor, a processor frequency of 1600 MHz, 2048 MB of RAM, a DDR3 1066 MHz RAM type, and a hard drive capacity of 1000 GB. The sound meter was installed on a tripod with an adjustable height for each patient at a distance of 30 cm from the patient's mouth. The signal was recorded without amplification and filters on the computer's sound board. The recorded voice is saved in a WAV audio file.

Results. Distributions of the results of most objective acoustic parameters of the voice differed from normal (the significance level p of the Shapiro-Wilk criterion < 0.05), which determined the choice of the nonparametric Wilcoxon criterion for further comparison. The results of the acoustic analysis of the voice showed that after the course of lavage of the lacunae of the palatine tonsils, statistically significant changes in most objective acoustic parameters of the voice are observed, the significance level $p < 0.05$ of the Wilcoxon criterion. In order to correct for multiple comparisons of the results of the acoustic parameters of the voice, the Bonferroni correction was applied to the obtained significance levels p of the Wilcoxon criterion. As a result, the differences in most indicators remained significant (significance level $p < 0.05$ after Bonferroni correction), namely, there was an increase in the tonal range of the speech voice in semitones (Pt): median before treatment - 16 (MR 10-19) and after treatment - 21 (MR 17-25), an increase in the tonal range of the vocal voice (Pt): median before treatment - 26.5 (MR 20.75-31.25) and after treatment - 30 (MR 24-34), an increase in the dynamic range of the speech voice (dB): median before treatment - 36 (MR 33-40) and after treatment - 40.5 (MR 36-45), an increase in the dynamic range of the vocal voice (dB): median before treatment - 41 (MR 33.75-47) and after treatment - 45 (MR 38.75-56.25), an increase in the intensity of the cry (dB): median before treatment – 97.5 (MP 91–102) and after treatment – 100.5 (MP 95–105.25), increase in maximum phonation time (sec): median before treatment –15.59 (MP 13.35–20.2025) and after treatment –19.505 (MP 16.275–23.87), decrease in Shimmer (%): median before treatment –5.375 (MP 4.89–7.5475) and after treatment –4.945 (MP 4.3275–4.705), decrease in Jitter in %: median before treatment –0.185 (MP 0.1275–0.295) and after treatment – 0.12 (MP 0.1–0.1725), decrease in the coefficient of irregularity of vocal fold closure: median before treatment – 0.84 (MR 0.7775–0.9825) and after treatment –0.78 (MR 0.7175–0.8575), increase in the dysphonia index: median before treatment – 2.9 (MR 1.375–3.9) and after treatment – 3.85 (MR 2.75–4.975), increase in the frequency range of conversational speech (Pt): median before treatment – 10 (MR 9–11) and after treatment – 11 (MR 9–11), increase in the dynamic range of conversational speech (dB): median before treatment – 17.895 (MR 14.975–19.025) and after treatment – 18.75 (MR 16.7–21.2175).

Statistically significant changes were also found in the results of the VHI questionnaire as a whole and in its three components: a decrease in the coefficient of the physiological component of the questionnaire: median before treatment –4 (MR 3–

6.25) and after treatment –2.5 (MR 1–4), a decrease in the coefficient of the physical component of the questionnaire: median before treatment –7 (MR 5.75–9) and after treatment – 3 (MR 1–5), a decrease in the coefficient of the emotional component of the questionnaire: median before treatment – 3 (MR 1–5.25) and after treatment – 0.5 (MR 0–2), a decrease in the total indicator of the voice disorder index: median before treatment – 14.5 (MR 10.75–20.25) and after treatment – 6.5 (MR 2.75–10.25). However, the change in the following acoustic parameters was not statistically significant: increase in frequency of frequency (Hz) – median before treatment – 219.62 (MR 197.575–246.28) and after treatment – 231.025 (MR 202.26–271.185), intensity of a quiet voice (dB): median before treatment – 56 (MR 54–59) and after treatment – 56 (MR 54–58), intensity of a normal (habitual) voice (dB): median before treatment – 65.5 (MR 64–69) and after treatment – 66 (MR 64–70), intensity of a loud voice (dB): median before treatment – 77 (MR 73–79) and after treatment –78 (MR 73.75–81.25), decrease in the coefficient of duration of exhalation during phonation: median before treatment – 0.905 (MP 0.7975–1.03) and after treatment –0.9 (MP 0.8225–0.9825), decrease in the coefficient of the level of normalized noise energy in the sound signal: median before treatment –0.34 (MP 0.29–0.5175) and after treatment – 0.315 (MP 0.23–0.4675) (table).

Of the 40 patients, only 5 (12.5%) patients did not show any changes in the larynx during video laryngostroboscopy, in the remaining 35 patients, the existing pathological changes were distributed by nosological forms as follows: functional dysphonia was noted in 29 (72.5%) patients, of which 2 patients had hypohypertonic and 21 (52.5%) – hypotonic dysphonia, chronic laryngitis occurred in 6 (15%) patients. In patients with hypotonic dysphonia (n = 21), video laryngostroboscopic examination before the course of treatment showed that the glottis during phonation had an oval or triangular shape, and the oscillations were asynchronous. During breathing, a loose edge of the vocal fold and gaping of the laryngeal ventricles were determined. The vibratory insufficiency index in these patients ranged from 1.4 to 1.8 points. Two patients suffered from the hypohypertonic form of dysphonia, which is characterized by hypotonicity of the vocal folds and hypertonicity of the vestibular folds. During video laryngostroboscopic examination, the vocal folds were in a state of hypotonicity, the vestibular and aryepiglottic folds were hyperemic and injected with vessels due to the forced manner of voice production. During phonation, the vestibular folds tightly closed over the vocal folds, and at the moment of inhalation they contracted to normal sizes and did not interfere with the examination of the vocal folds. It was not possible to evaluate the stroboscopic picture in these patients, since the vocal folds were not visible during phonation.

Chronic catarrhal laryngitis was detected in 6 (15%) examined patients: stroboscopically, vocal fold vibrations were weakened, the phenomenon of marginal

displacement of the mucous membrane was negative. In this subgroup of patients, the vibratory insufficiency index ranged from 2.0 to 2.4 points.

During a repeat examination 1–2 days after the end of the treatment course, normalization of the videostroboscopic picture was observed in 21 (52.5%) of 40 patients, hypotonic dysphonia persisted in only 8 patients. Comparison of these differences using the chi-square criterion with Yates' correction showed statistically significant changes: the chi-square criterion value was 20, the significance level was p = 0.000007. From this, it can be concluded that the course of sanitation of the palatine tonsil lacunae contributed to the normalization of the vocal fold tone. The vibratory insufficiency index decreased to 1.2–1.4 points.

Organic changes persisted in 6 subjects with chronic catarrhal laryngitis. No significant changes in the stroboscopic picture were observed after the end of the treatment course. Vocal fold vibrations were weakened, the phenomenon of marginal displacement of the mucous membrane was negative.

Conclusion. Chronic inflammation of the tonsils affects the functional state of the larynx. Conservative treatment of patients with simple and toxic-allergic 1 forms of chronic tonsillitis contributes to the positive dynamics of the main acoustic parameters of the voice - the coefficient of instability of the fundamental tone frequency (Jitter), dysphonia index, expansion of the tonal and dynamic range, maximum phonation time, reduction of irregularity of the closure of the vocal folds. Conservative treatment of patients with simple and toxic-allergic 1 forms of chronic tonsillitis contributes to the positive dynamics of the quality of life of patients according to the Voice Handicap Index questionnaire. Conservative treatment of patients with simple and toxic-allergic 1 forms of chronic tonsillitis contributes to the positive dynamics of the tone of the vocal folds according to videolaryngostroboscopy.

References:

1. Akhundjanov U. S. K. N. A., Djuraev A. Z. S. J. A. INITIAL STATE OF COCHLEOVESTIBULAR FUNCTION IN PATIENTS WITH HD WITH CVD. – 2022.
2. Botirov A. J. et al. Clinical and morphological results of xenografts to use in myringoplasty //The International Tinnitus Journal. – 2020. – T. 24. – №. 1. – C. 1-6.
3. Boymuradov S. A. et al. RESULTS OF ELIMINATION OF POST-TRAUMA DEFORMATIONS OF THE FACIAL AND JAW AREA (LIPOFILLING) //Oriental Journal of Medicine and Pharmacology. – 2023. – T. 3. – №. 02. – C. 1-13.

4. Djuraev J. A. et al. MIGRAINE: BASIC PRINCIPLES OF TREATMENT AND PREVENTION //International Journal of Medical Sciences And Clinical Research. – 2023. – T. 3. – №. 02. – C. 88-91.
5. Djuraev J. A. et al. MODERN METHODS OF TREATMENT OF VIRAL HEPATITIS //International Journal of Medical Sciences And Clinical Research. – 2023. – T. 3. – №. 02. – C. 69-75.
6. Djuraev J. A. et al. POLYCYSTIC OVARY SYNDROME: A MODERN VIEW ON THE PROBLEM //International Journal of Medical Sciences And Clinical Research. – 2023. – T. 3. – №. 02. – C. 83-87.
7. Djuraev J. A. et al. Results of Frequency Analysis Distribution of Polymorphism Rs1800895 592c> A In Il10 Gene among Patients with Chronic Polypoid Rhinosinusitis //The International Tinnitus Journal. – 2021. – T. 25. – №. 2. – C. 176-180.
8. Djuraev J. A. Prevalence of Allelic and Genotypic Variants of Il4, Il10, Il12b and Tlr2 Gene Polymorphism in Patients with Chronic Polypoid Rhinosinusitis.
9. Djuraev J. A., Fayozov S. F. Rhinoplasty In Combined Deformations Of The Nose //International Scientific and Current Research Conferences. – 2021. – C. 58-59.
10. Khasanov U. S. et al. A COMPLEX APPROACH TO THE TREATMENT OF ACUTE SENSONEURAL HEARING LOSS OF DIFFERENT GENES //Oriental Journal of Medicine and Pharmacology. – 2023. – T. 3. – №. 02. – C. 14-25.
11. Khasanov U. S. et al. BOLALARDA EKSUDATİV OTITNI DAVOLASH USULI //Oriental Journal of Medicine and Pharmacology. – 2022. – T. 2. – №. 1. – C. 64-80.
12. Khasanov U. S. et al. INITIAL STATE OF COCHLEOVESTIBULAR FUNCTION IN PATIENTS WITH HD WITH CVD //The American Journal of Medical Sciences and Pharmaceutical Research. – 2022. – T. 4. – №. 01. – C. 60-73.