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Therapeutic tactics for chronic tonsillitis in patients with functional dysphonia (Literature review)

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ABSTRACT

Topicality. The voice plays a huge communicative role in our life, and in the professional activities of people for whom voice and speech are a "tool" of labor, voice formation disorders can lead to temporary or permanent disability. The vocal tract includes three systems: aerodynamic or energy (lungs), vibratory (vocal folds) and resonator (upper and lower resonators), and with the central nervous system in order to form voice and speech [1]. Being part of the resonator part of the vocal apparatus, the palatine tonsils affect the voice and speech. It is assumed that this effect is due to two reasons. First, the palatine tonsils affect the resonance in the vocal tract by volumetric exposure [2]. Secondly, the palatine tonsils can influence resonance along with articulation due to their tissue characteristics [3]. According to modern ideas, 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 [4]. In modern clinical practice, up to 80 metatonsillar diseases are known [5]. However, the question of the impact of chronic tonsillitis on the voice function has not yet been finally resolved [6, 7]. **Objective:** to study the latest literature on therapeutic tactics in chronic tonsillitis in patients with functional dysphonia

Keywords:

chronic tonsillitis, functional dysphonias, palatine tonsils, carecous plugs.

Material and methods: The analysis of Russian- and English-language scientific literary sources is carried out.

Among the causes of functional voice disorders in chronic tonsillitis are disorders of nervous reflex mechanisms, changes in the volume of the oropharyngeal resonator, changes in local and general immunological reactivity of the body [9]. The pain that occurs in tonsillopharyngitis prevents the complex motor act carried out by the pharynx from being performed fully. In addition, the inflammatory process in the mucous membrane disrupts the normal functioning of the receptor elements of the

trigeminal, glossopharyngeal, and vagus nerves, resulting in changes in both the timbre and the normal mode of vibration 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 effect of chronic tonsillitis on the clinical and functional state of the larynx remains relevant. According to the National Guidelines for Otorhinolaryngology (2016), chemotherapy is "an active chronic inflammatory focus of infection in the palatine tonsils with a general infectious allergic reaction with periodic

exacerbations" [2]. The palatine tonsils are part of the nasopharyngeal-associated lymphoreticular tissues (NALT), which in turn is an integral part of the mucous membrane-associated lymphoid tissue (MALT) system, a system whose activity is associated with the barrier function of the mucous membrane and is manifested by the local production of secretory immunoglobulins [4,9]. They are not only an organ of the secondary immune system that protects against pathogenic microorganisms, but also a site of a recurrent inflammatory process. The inflammatory process occurs in response to the action of various pathogenic factors of exogenous or endogenous nature and is characterized by the development of a standard complex of vascular and tissue changes [9]. During inflammation, cells of the immune and hematopoietic systems are activated, which produce mediators of immune reactions - cytokines. Among cytokines, interleukin-1 (Il-1) enhances chemotaxis, phagocytosis, hematopoiesis, as well as vascular wall permeability and cytotoxic activity. Il-1 stimulates the production of tumor necrosis factor-alpha (TNF).

The causes of functional voice disorders in chemotherapy are considered to be disorders of neuroreflex mechanisms, changes in the volume of the oropharyngeal resonator, changes in local and general immunological reactivity of the body [14].

Thus, the negative effect of chemotherapy on the functional state of the larynx can be explained by the mechanisms of the inflammatory process, accompanied by an increase in vascular permeability and glycogenolysis with a decrease in muscle contractions of the internal laryngeal muscles, a slowdown in the regeneration of myoblasts and stimulation of proteolysis processes with an increase in blood filling of the vocal folds, as well as an extensive network of laryngeal-pharyngeal anastomoses of lymphatic vessels and a violation of nervous-reflex connections.

Jitter and Shimmer display involuntary changes (or perturbations) in the PRT and voice intensity (SPL) from one vibration cycle to the next [1,13]. Both of these indicators are determined as a result of vowel phonation, the

patient pronounces a long and continuous vowel (mainly [A], [O] or [I]) with a comfortable timbre and volume.

M. Naraghi et al. (2015) used the PVHI (Pediatric Voice Handicap Index) and PVRQOL (Pediatric Voice-Related Quality of Life Questionnaire) to assess the quality of life of children with voice disorders with tonsillar problems and adenoids. PVHI, a modified version of the adult questionnaire, consists of 23 questions in 3 parts: functional, physical, and emotional. The functional section contains 7 questions, the physical section contains 9 questions, and the emotional section contains 7 questions. Higher results on a 92-point scale indicated a greater degree of voice disorders. The PVRQOL questionnaire contains 10 questions and is a modified version of the adult version. The result of the survey was evaluated on a 100-point scale: the higher the value of the result, the higher the patient's quality of life. The study demonstrated a significant improvement in PVHI and PVRQOL after surgery, from which it was concluded that adenotonsillectomy had a beneficial effect on the child's voice [12].

S.C. Dimatos et al. (2016) studied 26 children - 16 boys and 10 girls from 5 to 10 years old - with grade III and IV hypertrophy of the palatine tonsils according to the Brodsky scale (2009), adenoid hypertrophy with nasopharyngeal obstruction by more than 70% before and after adenotonsillectomy by the "cold" method. PT, Jitter, Shimmer, HNR were studied in the preoperative period and 1 and 3 months after surgical treatment. Computer acoustic analysis of the child's voice was carried out to assess the vowels [A], [I] and [U] using Praat software (Amsterdam, Netherlands) [14]. Statistically significant changes were found for Shimmer and HNR for the vowel [U] in the preoperative period and 1 month after surgery. No significant differences in acoustic parameters were found between the preoperative period and three months after surgery [5].

On average, according to the literature, the complete restoration of vocal function in a professional volume after tonsillectomy in a singer can take from 3 to 6 months [13]. According to Ivanova O.E., in first-year students of the music college who suffered from chronic

tonsillitis, laryngeal pathology was diagnosed in 92.5%. At the same time, hypotonia of the vocal folds was detected in 74%, in 18.5% inflammatory phenomena in the larynx and trachea.

A number of studies note that adenoid and tonsillar hypertrophy can cause hypernasal speech, predominant mouth breathing, lowering of the lower jaw and tongue, "adenoid face" and snoring with or without obstructive sleep apnea. Since the palatine tonsils do not have a direct effect on the closure of the velopharyngeal valve, as is the case with the adenoids, the connection between the velopharyngeal valve and the palatine tonsils is indirect. Hypertrophic palatine tonsils can impair speech by altering oropharyngeal resonance, leading to nasal speech [12]. However, even noticeably hypertrophic palatine tonsils usually remain below the level of closure of the soft palate, without interfering with the normal functioning of the velopharyngeal valve [13]. Shprintzen R.J. et al. reported that velopharyngeal valve insufficiency resolved in 16 out of 20 patients after TE without additional phonopedic correction [13].

Zh.G. Romanova (2008) notes the exceptional importance of delicate performance of TE: in the study group, 20 patients were monitored who in the postoperative period underwent complex therapy with neuromuscular conduction stimulators (Neuromidin) and drugs for the treatment of snoring, increasing the tone of the muscles of the pharynx and soft palate (Slipex). The age of the patients ranged from 17 to 45 years: 6 men and 14 women, of which 19 belonged to persons of voice and speech professions. In the early postoperative period (on days 2-3), 15 patients in the main and 17 control groups had edema of the soft palate, which was clinically manifested by pronounced nasality and lack of speech intelligibility. In 2 patients of the study group and 3 patients of the control group, there was a reflux of liquid food through the nose. As a result of the rehabilitation, after 2 weeks in the study group, the mobility of the soft palate was restored in all patients; there was no shade of nasality.

To assess velopharyngeal function, some authors recommend performing a preoperative lateral cephalogram during phonation in all patients [13]. A dynamic study such as fluoroscopy demonstrates the movement of the soft palate and pharyngeal walls and provides better visualization than static radiographs, but has been used much less frequently since the advent of fiber-optic nasopharyngoscopy.

Thus, the analysis of domestic and foreign literature shows that there is no unequivocal opinion about the effect of chronic inflammation of the palatine tonsils and TE on the voice. In the literature available to us, there is a limited number of works on the acoustic parameters of the voice in patients of vocal and non-vocal professions with chemotherapy before and after conservative and surgical treatment in the short and long term: the data on the problem under study differ. There is no comparative description of the VLS picture in patients of voice-speech and non-vocal professions with compensated and decompensated forms of chemotherapy before and after conservative and surgical treatment in the immediate and remote periods. The quality of life and voice in people with vocal and non-vocal professions with chemotherapy before and after conservative treatment – in the short and remote periods – was not fully assessed. The dynamics of the clinical and functional state of the larynx in persons of vocal and non-vocal professions compensated and decompensated by forms of chemotherapy before and after conservative and surgical treatment – in the immediate and remote periods – has not been sufficiently studied. These circumstances prompted us to conduct our own research on this problem.

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