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ASSESSMENT OF THE INFLUENCE OF OSTEOPATHIC MYOFASCIAL TECHNIQUES ON NORMALIZATION OF THE VOCAL TRACT FUNCTIONS IN PATIENTS WITH OCCUPATIONAL DYSPHONIA

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Abstract

Objectives: Occupational voice disorders are accompanied by increased tension of the external laryngeal muscle which changes the position of the larynx and consequently disturbs the conditions of functioning of the vocal tract. The aim of the study is to assess the use of osteopathic procedures in the diagnosis and treatment of occupational dysphonia. **Material and Methods**: Study subjects included 40 teachers with chronic diseases of the voice organ (38 women and 2 men) aged from 39 to 59 (mean age: 48.25). Before and after the voice therapy the osteopathic examination according to Libermann's protocol was performed as well as phoniatric examination including laryngovideostroboscopy (LVSS), assessment of the maximum phonation time (MPT) and the Voice Handicap Index (VHI) score. The voice therapy, scheduled and supervised by a laryngologist-phoniatrician and conducted by a speech-language pathologist, was supplemented with osteopathic myofascial rehabilitation of the larynx. The chi-square McNemar test and non-parametric Wilcoxon matched pairs test were applied in the statistical assessment. **Results:** The applied interdisciplinary treatment including osteopathic and vocal therapy resulted in a statistically significant decrease in tenderness of muscles raising the larynx (cricothyroid ligament, sternocleidomastoid muscles, and pharyngeal constrictor muscles) and in lowering the tonus (geniohyoid muscles, pharyngeal constrictor muscles and sternocleidomastoid muscles). A significant improvement was also observed in the case of dysfunction of the cricothyroid joint examined during glissando and yawning, as well as in asymmetry of the thyrohyoid apparatus. Moreover, the therapy resulted in significantly better normalization of the head position and better control of the centre of gravity of the body. Statistically significant post-therapy improvement was observed in the phoniatric examination, including VHI scores, MPT results and parameters of videostroboscopic examination. **Conclusions:** The use of osteopathic therapy helps significantly improve the functions of the vocal tract in patients with occupational dysphonia.

Key words:
Occupational dysphonia, Osteopathy, Manual myofascial techniques

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INTRODUCTION

Dysphonia is a multiform voice disorder comprising all acoustic components, i.e. frequency, volume, duration and timbre. Each change of the timbre diverging from the norm is called hoarseness. It is caused by incorrect vibration of the vocal folds with turbulent air irregularly crossing the glottis during phonation [1]. The problem of voice disorders most often concerns persons whose voice is a working tool [2,3]. During the initial period, occupation-related voice disorders have the character of functional dysphonias, and the voice dysfunction is reversible. Functional dysphonias are most often caused by incorrect phonatory mechanisms [4]. They result from a pathological function of internal and external muscles of the larynx, disturbed proportion between tensing and relaxing antagonistic muscles and impaired respiratory-phonatory-articulatory coordination. In persons using their voice professionally, functional dysphonias most often precede the development of organic changes on the vocal folds that limit the efficiency of the vocal organ and often prevent work with the voice [5].

The clinical picture of occupational dysphonias is characterized by a wide symptomatology, in which functional disorders of hyperfunctional character and symptoms of vocal fatigue are dominant [6]. In hyperfunctional dysphonia, it leads to excessive tension of the muscles not only of the larynx and pharynx, face and neck but often also of the thorax and abdominal walls. Because of that, in persons with hyperfunctional dysphonia, disorders within the musculoskeletal system occur very often, involving the muscular-fascial-ligamentous system and disturbing the posture of the whole body [7,8].

The relation between body posture and production of sound was noted as early as 1949 by Feldenkreis [9]. Incorrect head position, lumbar hyperlordosis and bringing the chin forward cause excessive tension of the suboccipital and neck muscles and in consequence chronic tension and shortening of the cricothyroid muscle, and habitual wrong position of the larynx. Hyperkinesis of the suprahyoid (digastric, stylohyoid, mylohyoid and geniohyoid) muscles and infrahyoid (sternohyoid, omohyoid, sternothyroid and thyrohyoid) muscles causes discomfort in the pharynx area, voice fatigue and even aphonia. Anatomical relations of individual muscles of the larynx and their connections cause that the disorder of one structure entails further dysfunctions leading to the imbalance of the whole area. Also incorrect breathing during the voice emission causes pathological tensions within the neck and shoulder girdle. In turn, the incorrect body posture leads to desynchronization of the breathing process, making phonation difficult in occupational speakers [10].

Moreover, stiffening of the spine muscles, scoliosis and inflammation of the spine area restricting thoracic mobility and causing habitual posture leading to asymmetry of the larynx also favour the occurrence of dysphonia. Taking an incorrect posture, incorrect breathing can also be connected with stress or emotional strain [11,12]. Stress is a factor additionally burdening muscles and joints indirectly and directly connected with the larynx. That is why the holistic approach to the problem of dysphonia is essential, taking into account interdisciplinary actions in its diagnosis and treatment [13,14].

For the above reasons, in recent years there has been growing interest interest in applying osteopathic techniques for treating voice disorders [15]. Osteopathic therapy can alleviate musculoskeletal system dysfunction associated with occupational dysphonias, and the manipulation of tissues directly connected with the larynx is expected to reduce the excessive tension of muscles. Osteopathic techniques permit the appropriate arrangement of the larynx structures to be restored, to relax and stretch muscles indirectly and directly connected with phonation. Moreover, restoration of the correct breathing, muscular balance and proper functional anatomical relations have a key significance for improving the function of the larynx. According to Rubin et al. [16] the indications for larynx manipulation

are the following symptoms: pain in the larynx area, voice loss, loss of vocal range, decrease in efficiency of the voice organ, dry larynx, problems with swallowing, feeling of pressure in the sternum area and a constricting sensation at the root of the tongue.

It should be stressed that even one correctly carried out osteopathic treatment normalizing the function of the voice organ can bring the desired result. However, for the therapeutic programme to be successful, it is important that the patient accepts and applies the therapist's indications concerning the appropriate head posture. Getting into the appropriate habits of posture requires more time than a few therapies.

In the literature of the subject, osteopathic therapy in occupational voice disorders based on the full phoniatric diagnostics has not been assessed so far. Because of that, the aim of the paper was to assess the application of manual osteopathic techniques in interdisciplinary voice rehabilitation in persons with occupational dysphonia.

AIM OF STUDY

The aim of the paper is to evaluate the application of osteopathic techniques in patients with occupational dysphonia by means of the methods of phoniatric examination.

The effectiveness of osteopathic therapy during intensive voice rehabilitation performed in a health spa by an interdisciplinary team comprising a laryngologist/phoniatrist, voice therapist and physiotherapist/osteopath was assessed.

STUDY MATERIAL

Forty teachers with chronic diseases of the voice organ treated with intensive voice rehabilitation during a week stay in the health spa participated in the study. The mean age was 48.25±5.26 years. The youngest studied person was 39, and the oldest 59. The patients were referred to the health spa by laryngologists/phoniatrists working in the Voivodeship/Regional Centres of Occupational Medicine in the whole of Poland. Patients' stay in the health spa was arranged by the Clinic of Audiology and Phoniatrics of the Institute of Occupational Medicine in Łódź as part of the programme Human Capital.

METHODS

Phoniatric and osteopathic examination before and after the applied therapy was performed in all participants. The osteopath assessed the patients by palpation according to the Liebermann scale [16], examining them in a sitting, standing and prone position. He assessed in detail visually and by palpation the posture, tension (muscle tension assessed by osteopath), tenderness (painful symptoms assessed by patient during palpation examination) and function of anatomical structures indirectly and directly connected with the vocal tract.

Phoniatric examination comprised routine laryngological examination, perceptual assessment of voice and laryngeal videostroboscopy (LVSS). The LVSS enabled not only the precise evaluation of larynx structures, but also assessment of phonatory function, which is essential in early diagnosis of functional dysphonia. The following parameters of the phonatory function were examined: the quality of the mucosal wave, regularity of vocal fold vibration, amplitude of vocal fold movement and configuration of glottal closure.

Moreover, measurement of the maximum phonation time (MPT), a valuable aerodynamic parameter indicating voice efficiency was performed. MPT measurement consists in determining the maximum phonation time of the "a" sound during full exhalation. The measurement is repeated three times; the normal mean value is 20 s.

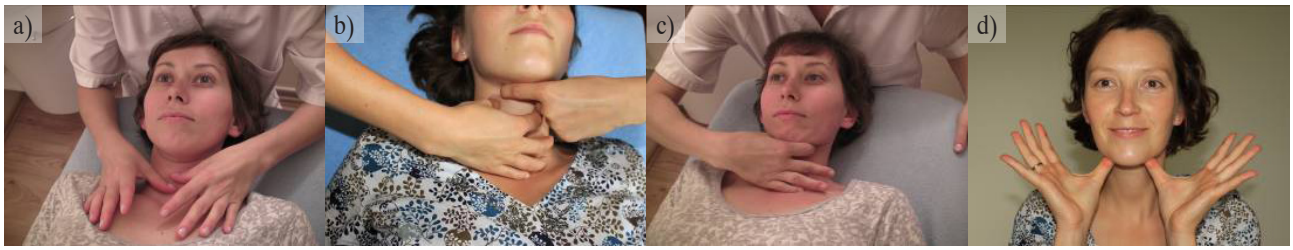
During the preliminary examination the participants completed the Voice Handicap Index (VHI) questionnaire, which is the most commonly used tool for self-evaluation of voice disorders. It consists of 30 statements concerning

the three spheres: functional (describing the influence of voice disorders on the daily social and occupational activity), emotional (taking into account the patient's feelings concerning his/her own voice) and physical (concerning physical ailments connected with the disease of the voice organ).

Intensive and multispecialist voice rehabilitation carried out during the stay in the health spa comprised, apart from balneological treatment, voice production exercises, relaxation and aerobic activities, and also osteopathic techniques with elements of manual therapy of the larynx.

The procedure of intensive voice therapy in health spa conditions has been described in detail elsewhere [17]. Below there is a description of osteopathic techniques applied during the stay in the health spa. The two individual therapies lasted half hour each. During the therapy the following techniques were applied [15,16,18–23]:

1. Global techniques concerning occiput, neck and cervico-thoracic junction:
   - Fascial global neck normalization. The therapist places the patient's head in a maximum bend, and performs head rotation during exhalation, upon which apnoea of maximum intensity and maximum duration takes place.
   - Normalization of Jones points for cervical spine. The therapist looks for a Jones tender point and (depending on its location) bends, straightens or rotates the cervical spine, maintaining this (released) position for 90 s.
   - Facilitated positional release (FPR) technique to normalize the sternocleidomastoid muscle. The therapist looks for a tender point in the sternocleidomastoid muscle, bends the head forward, rotates it and bends it ipsilaterally, adding a 5-s compression in the head axis.
   - Jones point release technique for the supraspinatus muscle. The therapist holds with one hand a tender point in the supraspinous fossa and bends and abducts with the other hand the upper limb of the patient while looking for a painless position, and then waits for 90 s for the occurrence of relaxation of this tender point.
2. Techniques directly connected with the larynx:
   - Larynx mobilization by stretching the space between the thyroid cartilage and the cricoid cartilage. This technique decreases the tension of the internal muscles of the larynx. The therapist holds with one thumb the thyroid cartilage from below, and with the other thumb the cricoid cartilage from above, then he applies delicate pressure and stretching of the cricothyroid muscle (Foto 1a).
   - Mobilization of the hyoid bone towards the thyroid cartilage. This technique stimulates the thyrohyoid muscle and because of that improves the tone. The osteopath holds with the index finger and the thumb of one hand the thyroid cartilage and with the other index finger and thumb grasps the hyoid bone. One hand stabilizes the hyoid bone, and the other moves the thyroid cartilage aside, up and down (Foto 1b).
   - Mobilization of the hyoid bone during the swallowing. The therapist grasps the hyoid bone, moves it downwards and asks the patient to swallow saliva. It is a dynamic stretching of this area (Foto 1c).
   - Lateral mobilization of larynx. The therapist moves the larynx laterally to the moment of sensing the tissue resistance, holding it for 20 s. This technique increases the blood flow of the area and decreases its tension.
   - Fascial relaxation of the suprahyoid muscles. The therapist performs fascial relaxation of suprahyoid muscles, lowering the too high hyoid bone.
   - FPR technique for normalization of the cervical joint of the spine. The FPR technique consists in positional relaxation of the joint, using the parameters of bending, rotating and compressing 5 s.



Fot. 1. a) Stretching of the space between the thyroid cartilage and the cricoid cartilage, b) mobilization of the hyoid bone towards the thyroid cartilage, c) mobilization of the hyoid bone during swallowing, d) autotherapy of the suprahyoid muscles.

– Technique to normalize dysfunction at the level C0/C1 during which the therapist holds the occipital condyles with one hand, and mandible with the other; the patient presses diagonally with the mandible, whereby the therapist gains in the range of motion at the level of a given condyle.

During one group activities taking 1 hour the patients learned the autotherapy techniques: postisometric relaxation of the neck muscles and fascial techniques decreasing tension of the thoracic outlet, such as:

– Postisometric relaxation of the trapezius muscle. In order to stretch the shortened muscle the patient places the hand on the opposite side of the head, bends it sideward to the first feeling of stretching and tries to straighten it, limiting the return movement with hand pressure for 8 s. Then he increases the range of stretching and repeats the tension [21,22].
– Postisometric relaxation of the levator scapulae muscle. The patient puts the hand on his/her head, bends the head diagonally and backwards in the opposite direction for 8 s, and then he/she increases the range and repeats the tension.
– Active relaxation of the nuchal fascia. The patient presses with the flat hand the tender point in the trapezius muscle, at the same time bending and straightening his/her head several times in the opposite direction.
– Relaxation of the suprahyoid muscles. The patient arranges the thumbs at the level of the angle of the mandible and moves them slowly chin-wards (Foto 1d).

For the purpose of statistical analysis of the obtained data, a range of statistical methods was applied. For all quantitative parameters, the conformity of their distribution with the normal distribution was checked. The conformity assessment was carried out by the Shapiro-Wilk test. The level $p = 0.05$ was assumed as the critical significance level. For these quantitative parameters the following descriptive statistics were calculated: arithmetic mean (x), median (ME), minimum (min.), maximum (max), lower quartile (Q1), upper quartile (Q3) and standard deviation (SD). The Wilcoxon matched pairs test was applied to evaluate the influence of the applied therapy on the clinical characteristics for quantitative variables, while the McNemar chi-square test (B/C) was used for qualitative variables. For determining statistical significance of differences the following symbols were applied: $p < 0.05^{*}$, $p \leq 0.01^{**}$ – statistically significant values, $p \geq 0.05^{(ns)}$ – statistically non-significant value.

After the completed treatment, each patient was re-examined using the methods described above.

RESULTS

The results of the osteopathic examinations were analysed according to the Liebermann protocol. The examination results before and after the applied voice rehabilitation were compared (Table 1).

Table 1. Changes in parameters of individual anatomical structures in the palpation and visual examination in persons undergoing osteopathic therapy during the voice rehabilitation in health spa (N = 40)

Anatomical structures	Parameter	Persons with dysfunction (%)		Persons (n)		Statistical significance between deterioration and improvement
		before therapy	after therapy	with improvement	with deterioration	
Hyoid bone	height of arrangement	40.0	30.0	4	0	ns
Geniohyoid muscles examined in static condition	tonus	25.0	7.5	7	0	*
	tenderness	22.5	10.0	5	0	ns
Muscles raising the larynx: examined in static condition	tonus	72.5	42.5	13	1	**
	tenderness	52.5	12.5	16	0	**
Pharyngeal constrictor muscle examined in static condition	tonus	42.5	12.5	12	0	**
	tenderness	55.0	25.0	12	0	**
Thyrohyoid apparatus examined in static condition	position of hyoid bone relative to thyroid cartilage	50.0	42.5	6	3	ns
	size of gap	87.5	72.5	7	1	ns
	tenderness	57.5	42.5	9	3	ns
	symmetry	65.0	40.0	12	2	**
Cricothyroid muscles examined in static condition	tonus	47.5	30.0	9	2	ns
	tenderness	42.5	22.5	9	1	*
Cricothyroid space	stationary phase	57.5	45.0	5	0	ns
Cricothyroid joint examined in dynamic condition	glissando	37.5	12.5	11	1	**
	changes during yawning	27.5	7.5	9	1	**
Arrangement of the centre of gravity and of the head – view from the side in the standing position	control of centre of gravity	40.0	15.0	10	0	**
	head position	92.5	47.5	18	0	**
Sternocleidomastoid muscles	tonus	82.5	55.0	12	1	**
	tenderness	72.5	42.5	12	0	**

Ns – statistically insignificant value $p \geq 0.05$.
* $p < 0.05$, ** $p \leq 0.01$ – statistically significant (McNemar Chi2 test).

After the applied therapy, the tenderness of the following muscles decreased statistically significantly: muscles raising the larynx, cricothyroid muscles, sternocleidomastoid muscles and the pharyngeal constrictor muscles. Also the tonus of "perilaryngeal muscles" comprising: Geniohyoid muscles, Suprahyoid muscles (Muscles raising the larynx), Pharyngeal constrictor muscle, Thyrohyoid muscles (Thyrohyoid apparatus), Cricothyroid muscles, Sternocleidomastoid muscles) was assessed; a statistically significant change occurred in the case of the following structures: geniohyoid muscle, muscles raising the larynx, pharyngeal constrictor muscle and sternocleidomastoid muscle. Moreover, there was a statistically significant change in head arrangement and control of the centre of gravity.

The percentage improvement of the state of individual anatomical structures assessed from their tonus and tenderness is presented in Figure 1.

After the applied treatment, the greatest improvement was observed in the case of tonus of the pharyngeal constrictor muscle and geniohyoid muscles and tenderness of the muscles raising the larynx.

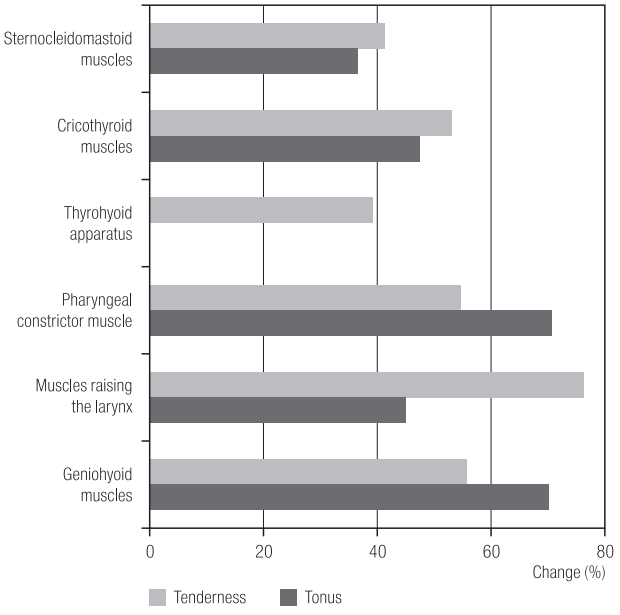


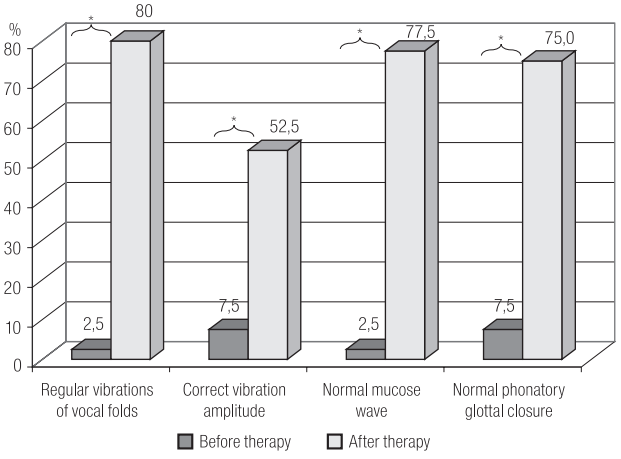
Fig. 1. Percentage of patients subjected to osteopathic therapy within multidisciplinary voice rehabilitation in whom an improvement was observed. Tonus and tenderness of individual muscle groups observed in static condition was assessed

Analogical improvement after multidisciplinary voice rehabilitation was observed in the phoniatric examination in subjective assessment of voice according to the VHI questionnaire as well as in objective examination.

Statistical analysis of results of the voice self-assessment according to the VHI showed significant improvement in the follow-up compared to preliminary examination for the total VHI score average: post-therapy 10 s vs. pretherapy 13.7 ($p = 0.000$). Then the mean result of the total VHI result after the treatment decreased by 19.6 scores. Similar improvement was noted for mean distributions of scores obtained in particular subscales of the questionnaire ($p = 0.000$). The result of the VHI functional subscale was significantly better than the result of this subscale assessed before therapy, on average by 4.4 scores. For the emotional subscale the result after therapy improved by 5.9 points, whereas in the physical subscale the greatest improvement, by 9.2 scores, was observed.

Analogical observations were made after the applied treatment by comparing results of individual videostroboscopic parameters in the preliminary and the control examinations. The statistical analysis using the non-parametric Wilcoxon test showed significant improvement ($p = 0.000$) for all parameters assessed in laryngovideostroboscopic examination. The percentage improvement ranged from 77.5% for the regularity of phonatory vibrations, through 75% for the quality of the mucosal wave and 67.5% for the configuration of phonatory glottal closure to 50% for the amplitude of phonatory vibrations (Figure 2).

Similar positive results after the treatment were observed for the objective aerodynamic parameter: the maximum phonation time (MPT), which was on average below 10 s in the preliminary examination, while after the applied therapy it increased and was on



Statistically significant value when $p < 0.05$ (*) (Wilcoxon matched pairs test). The bars present the percentage of subjects with normal parameters of LVSS.

Fig. 2. The results of laryngovideostroposcopy (LVSS) before and after voice rehabilitation in health spa

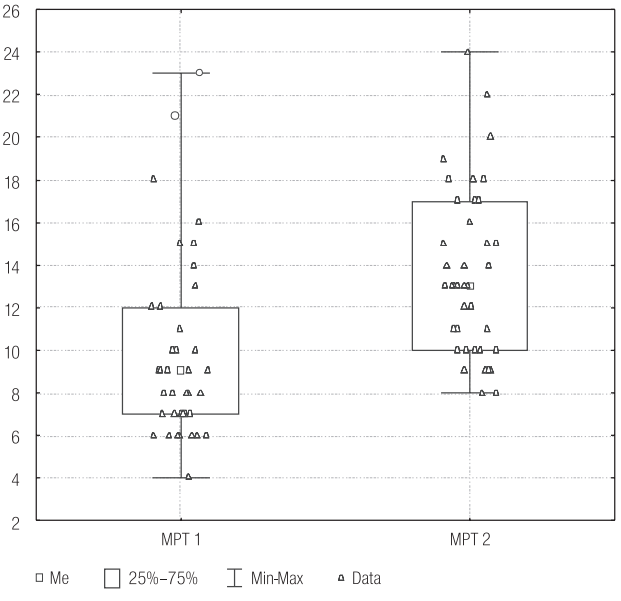


Fig. 3. Assessment of the value of the maximum phonation time (MPT) in the studied group measured before (MPT 1) and after the voice rehabilitation in health spa (MPT 2) (Wilcoxon matched pairs test, level $p \leq 0.01$**)

average 13.7 s (Figure 3). The statistical analysis of the results showed that the difference was significant ($p = 0.000$).

DISCUSSION

In patients with hyperfunctional dysphonia an increased tension of the external muscles of the larynx is observed which changes its position relative to other structures of the vocal tract and as a result disturbs the conditions of voice production. Many authors have written about the relocation of myofascial tension from the neck and mandible area to structures located deeper, i.e. to the internal muscles of the larynx [13,16,24]. Because of that, it is worth including osteopathic techniques for thorough diagnostics of patients with occupational dysphonia, in particular those with occupation-related hyperfunctional dysphonia.

The aim of the study was to assess the usefulness of the osteopathic methods in the process of normalization of structures of the vocal tract in patients with occupational dysphonia.

According to Rubin et al. [16] in order to carry out palpation examination of the anatomical structures indirectly and directly connected with the larynx, a very good knowledge of anatomy and palpation experience is necessary, which is within the competence of the osteopath.

The novelty of the paper has been the use of osteopathic assessment for evaluation of results of intensive voice rehabilitation. In the accessible reference books, no similar studies could be located that would report the combination of the osteopathic and phoniatric methods. After the interdisciplinary therapy in the health spa, the results of the treatment were assessed by phoniatric examinations including determination of VHI, MPT and videostroboscopic examination.

Longer (on average by 3.7 s) MPT and significantly improveved results of videostroboscopic examinations were noted. Moreover, significant differences in values of the VHI questionnaire were observed by comparing the results of the self-assessment obtained before and after the treatment. The total result of the Voice Handicap Index and the results in each of the subscales, functional,

emotional and physical, were significantly better after the applied therapy than before the treatment ($p < 0.001$).

In the accessible literature, the influence of applying the manual perilaryngeal techniques in patients with dysphonia was assessed [25]. However, that was a pilot study which included 10 patients and the therapy effectiveness was measured with parameters of acoustic assessment, without considering the videostroboscopic examination, and with the use of vocal tract discomfort (VTD) self-assessed by the patient. The authors of this paper proved the positive influence of the use of manual therapy as a method for treating occupation-related hyperfunctional dysphonia. In the described studies 40 patients took part and the results of the therapy were measured with subjective and objective methods of phoniatric examination, with videostroboscopy considered as a constant standard in the functional assessment of the voice organ.

The osteopathic perilaryngeal techniques also had an advantageous effect on the process of normalization of structures of the vocal tract assessed with the Liebermann scale. The value of the examination of external muscles of the larynx for the assessment of the state of the patients with dysphonia was presented in the paper by Ansuewansee and Morrison [8]. They conducted studies on 465 patients and showed that the palpation of the external muscles of the larynx can provide important information about the position of the larynx and enable the correct diagnosis. In their study, high statistical significance was found to exist between the tension of the thyrohyoid muscle and the observed dysphonia. In the study described in this paper, the tension of the thyrohyoid muscle was not checked, but its function was studied. Its disorder was observed in the preliminary examination during glissando (in 37.5% of patients) and during yawning (in 27.5% of patients), but in the follow-up after the applied therapy a decrease in observed dysfunctions in 12.5 and 7.5% of patients, respectively, was noted.

Kooijman et al. [7] studied the relation between excessive tension of the external muscles of the larynx, incorrect posture and voice handicap in 25 female teachers. They found that the combination of increased tension of the sternocleidomastoid and the geniohyoid muscles, and the centre of gravity displaced back predisposes most to voice handicap. In these described examinations, in patients with dysphonia, excessive tension of the sternocleidomastoid muscle was diagnosed in 82.5% of patients, found and the position of the centre of gravity moved to the front or the back was found in 40% of patients. The smallest proportion of patients were found to be affected by increased tonus of the geniohyoid muscle (only 25%). After the therapy these values were as follows: 55%, 15% and 7.5% of patients, respectively.

So far in the literature there is a lack of clinical studies assessing the increased tension of „perilaryngeal muscles" in occupational dysphonias. The excessive tension of even one of the muscle groups and incorrect posture can cause feelings of problems with voice. According to Koojman et al. [7], excessive muscular tension is a sign of problems with voice in teachers. According to Angsuearansee and Morrison [8], moving the chin forward increases the vocal effort and next causes increased tension of muscles around the larynx during phonation. If this posture is not corrected, it leads to chronic overloading of "perilaryngeal muscles" during phonation and increased tension of the larynx. Rubin et al. [16] also stress that incorrectly arranged head, incorrect posture, centre of gravity displaced forwards or backwards, excessive lordosis or kyphosis will be pathologically compensated in the form of excessive tension at the neck level and in the laryngeal area. Similarly, in these described studies, incorrect head position, i.e. its displacement forward, was observed in as many as 92.5% of studied patients with occupational dysphonia. After therapy, an improvement was observed in 45% of patients.

In the presented studies, after the treatment, the head position and also palpation assessment of tension of the sternocleidomastoid muscles significantly improved. This

translated into an improvement of functioning of the voice organ, manifested in the improvement of the results of the follow-up phoniatric examination, better self-assessment of voice according to the VHI and prolongation of the maximum phonation time (MPT).

An essential element of therapies of occupational voice disorders is the patient's education concerning the habit of appropriate posture and proper head position. This fact was stressed by Kooijman et al. [7], who assessed disorders of the body statics in teachers. Therefore, patients participated during an intensive rehabilitation of occupational dysphonias in the health spa in group autotherapy activities where they learnt to adopt and maintain a correct posture with the emphasis on developing the habit of correct head position. They also learned ways of unaided relaxation and stretching the muscles connected with the larynx. In our opinion, therapy of hyperfunctional dysphonia without the elements of autotherapy, as presented by some authors, e.g. Mathieson et al., seems to be insufficient [25]. Appropriate patient education ensures the constancy and effectiveness of therapy in occupational dysphonias, in particular hyperfunction-related ones.

The presented studies confirm the necessity for cooperation of the osteopath with a phoniatrist and voice therapist in the treatment of occupational dysphonias. This is in accordance with the current trend of an interdisciplinary approach to the therapy of these diseases taking into account also their psychosomatic aspects. These observations will allow us to increase the effectiveness of rehabilitation of patients with occupational disorders of the voice organ.

CONCLUSIONS

The results presented in the paper support the following conclusions:

1. The use of osteopathic therapy enabled a reduction in tenderness of the „perilaryngeal muscles", which positively influenced the conditions of voice production in persons with occupation-related hyperfunctional dysphonia.
2. Myofascial techniques enabled normalization of tonus of the „perilaryngeal muscles", which contributed to improved parameters evaluating the function of the vocal tract, including the maximum phonation time and parameters of videolaryngostroboscopy.
3. Presented results of the studies suggest that an osteopath should join the team rehabilitating persons with occupational dysphonia.

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