

Importance of Correct Therapeutic Procedure Selection in Voice Recovery

Josipa Pankas¹, Tatjana Šepić¹, Vlatka Pitlović², Marinela Rosso³ and Radan Starčević¹

¹ Clinic for Otorinolaryngology and Head and Neck Surgery, Rijeka University Hospital Centre, Rijeka, Croatia

² Department of Surgery, General Hospital in Slavonski Brod, Slavonski brod, Croatia

³ Department of Otorhinolaryngology and Head and Neck Surgery, Osijek University Hospital Centre, Osijek, Croatia

ABSTRACT

Psychological and physical patient state as well as the influence of other social factor is of great influence voice rehabilitation. A team of experts in the field of voice and its function are involved in voice therapy. Our research was focused on the successfulness of voice recovery depending on the patient vocal disorder approach. We made a comparison of two methods: RVT and Accent method. We attempted to evaluate clinically relevant voice disorders in relation to certain vocal methods, we propose that a lot can be learned about voice through therapeutic procedures, which can also be used to enhance the practical application of vocal methods and raise the level of success in dealing with people that suffer from voice pathology.

Key words: *vocal methods, accent method, RVT method, and brain*

Introduction

In order to explain why one vocal method would be more successful than the other in terms of rehabilitation we must start with the way voice is created¹. There are several theories on how voice is formed: mechanical, mio-elastical, aerodynamical, neurohronaxic and biophysical².

All the above-mentioned theories are intertwined and replenish each other. We will consider the biophysical theory that proposes that the central nervous system (CNS) is in control of phonation through nervous impulses coming to the larynx. CNS regulates the starting impulse and further vibrations are controlled through feedback loop – hearing. It is a reflex loop, which is based on proprioceptive analyzers, which has special significance for emissions of certain tones³.

The voice is created in the mouth by the position of the tongue, palate, teeth and lips and so speech is formed under the influence of the center in the cortex of the cerebrum. There are several parts of the brain, and centers related to voice and speech: temporal, prefrontal and parietal lobe⁴.

The following functions of each lobe were important in our investigation:

1. Frontal-motor area – enables the preconceived muscle use, detailed performance of fine voluntary movement
2. Parietal – processing and language comprehension
3. Temporal – the center for cortical representation of auditory senses

Basal ganglia, which are of great importance for motor function, release movement⁵.

According to Škarić (1991) there are three main groups of speech organs: Control group (central and periphery nervous systems), executor group (breathing organs, phonation, articulation) and sensory group (auditory and extra auditory control). There are numerous brain functions important to our investigation⁶.

There are several functions of importance to voice and speech depending on the hemisphere⁷: Left hemisphere is responsible for speech rhythm, making sense of

facts and lecture accents while the right hemisphere holds the importance on integration, emotion and prosody.

We must also emphasize the importance of working memory, which is a short-term memory that involves voluntary attention unlike watchfulness. Working memory capacity is responsible for all the individual differences in the cognitive processes and task completion. The central executor coordinates and controls the transfer of information between different parts of this system, therefore forwarding data to phonological and articulation loops and at the same time recalls information from long-term memory⁸.

Materials and Methods

Testing was conducted on 30 phoniatry patients. They were divided into two groups, a group with organ damage and one with functional impairments. To test our settings, groups were treated with various therapeutic procedures. Selection of therapeutic procedures was carried out according to ability, not age. Patients were of different ages and sexes. The goals of therapy are determined by the communication and personal profile. The therapy was carried out systematically, with the removal of auditory and visual distracters. The performance of two vocal methods was examined: RVT methods and methods of accent. The first group came once a week for 45 minutes on an exercise with the speech therapist (15 patients), the second group carried out the exercises independently at home. Rehabilitation lasted 6 weeks. We divide methods of vocal therapy into specific and non-specific. We will review the nonspecific because that is the group methods used in our investigation are in⁹. We divide the nonspecific vocal methods into integral (Accent method) and directed (RVT method). Integral methods of voice and speech disorders view the voice as a result of unique whole of all parts of voice and speech as well as all of their qualities. Directed methods come from each characteristic of voice individually. The importance is given to volume, intensity, resonance, rhythm, tempo and intonation. These voice qualities should be treated individually¹⁰. RVT method is characterized by a strong and clear voice that uses less tension in order to avoid vocal cord damage. Also it uses the air pressure in combination with cheek and nasal bone vibrations that are practiced through different exercises. It lasts for 8 weeks and utilizes changes in voice tone through a three step vocalization, emphasizes the importance of sensory input and uses feeling, listening and seeing in learning new skills⁴. The accent method is characterized by diaphragm breathing with contractions and releases, clearing of the throat and vocal cords, rhythmical whole body movements, creating new »motor programs« in the brain, adjusting phonation, respiration and articulation and making accent changes to words and syllables in different rhythms¹¹. Several aims, in which we attempted to cover the success rate issues of therapeutic procedures in voice recovery, have been set. Confirmation of which therapy, RVT or accent, was more successful in rehabilitation of voice disorders.

To ascertain why one was better than the other and what it means to voice disorders. To determine whether the success rate of therapy is important to build »motor maps« in the brain. To establish if there is a difference in regard to gender and to the way exercises were conducted (individually or with a speech therapist). Regular speakers and voice professionals, aware of their vocal abilities and restrictions were involved in our study. At first, the patients are warned about voice hygiene and preservation. It is necessary to use our voice in an appropriate manner in noise conditions, through telephone conversations and group talks. Special attention should be given to hydration of the air inhaled as well as the entire body. Lack of moisture between vocal cords can lead to swelling due to friction. The accent should be on easy and soft vocalization with soft start to phonation¹².

It is also necessary to watch the diet, overwhelming consumption of fatty and spicy foods, sweet and sparkling can lead to redness, swelling and other vocal problems. Special care should be taken not to consume alcohol and caffeine, to avoid antihistamines (dry larynx) as well as aspirin as it increases capillary sensitivity and has anticoagulation properties and can lead to vocal cords hemorrhage¹². Voice hygiene and preservation were followed by exercise, respirations and performance of vocal methods.

Results and Discussion

Patients using the accent method have had a more successful rehabilitation than the patients using the RVT vocal method (Table 1). The reason for that is the level of consciousness or the activation of specific speech functions in the brain. Tactile and kinesthetic reverse feedback loop are responsible for voice realization, tempo, volume, quality, articulation¹³. In performing the exercises of the RVT vocal method, the patient is focused on experiencing voice through the mentioned feedback loops, which happens on a less conscious, level with the delay of creating »motor maps« in the brain¹⁴. Accent method stresses the importance of breathing and its connection to movement and phonation. Movements release tension and use the human body as a great resonator and an in-

TABLE 1
THERAPY SUCCESS RATE DEPENDING ON THE METHOD USED

Success rate of vocal methods	RVT method	Accent method	Total
No change	1	3	4
Satisfactory voice	7	11	18
Very satisfactory voice	3	0	3
Excellent voice	2	1	3
*»New« voice	2	0	2
Total	15	15	30

*voice of sufficient quality with a new way of phonation established

TABLE 2
DIFFERENCES IN RVT METHOD SUCCESS RATE DEPENDING ON GENDER

Gender	RVT method	
	Success	No change
M		2
–	4	2
F	10	9
–		1

TABLE 3
DIFFERENCES IN ACCENT METHOD SUCCESS RATE DEPENDING ON GENDER

Gender	Total	Accent method	
		Success	No change
M		4	
–	5	1	
F		11	
–	11	0	

TABLE 4
COMPARISON OF DIFFERENT METHODS SUCCESS RATE IN RELATION TO GENDER

Gender	RVT		Accent		Total
	success	no change	method success	method no change	
M	2	2	4	1	9
F	9	1	11	0	21
Total	11	3	15	1	30

strument for voice creation. During the conductance of these »useless« exercises there is an instantaneous creation of »motor maps« in the brain. This utilizes a higher level of speech functions of the brain¹⁵. There was no significant difference in the success rate based on gender bias in proportion to the number of female and male patients (Table 2). If we ignore the disproportion in gender size, male patients were less successful in the therapeutic procedures (Table 2 and 3). By comparing the success rate, depending on the method used, we come to the conclusion that females performed better (Table 4). There are several differences in the function of the male and female brain that can also be the reason for the differences

REFERENCES

1. ESTILL J, Voice Craft: A Users Guide to Voice Quality (Santa Rosa, 1995). — 2. CVEJIĆ D, KOSANOVIĆ M, Fonijatrija (Univerzitet u Beogradu, Beograd, 1982) 36. — 3. BOONE DR, McFARLANE SC, The voice and voice therapy (Englewood Cliffs, N.J. Prentice Hall, 1994). — 4. BERRY DA, VERDOLINI K, CHAN RW, TITZE IR, J Speech Hear Disord, 12 (1998) 33. — 5. MOCK JR, FOUNDAS AL, GOLOB EJ, EJN, 33 (2011) 1001. — 6. BUCCINO G, RIGGIO L, Kineziologija, 38 (2006) 1. —

in success rate in therapy. Research shows that the Brock and Wernicke areas are larger in female brains. The female brain processes spoken language in frontal lobes of both hemispheres simultaneously while men do the same using primarily the left hemisphere. Due to this difference females are generally better at verbal skills¹⁵. Due to advanced neuroscientific methods and instruments an area in the inferior parietal lobe, significantly larger in males, has been discovered. The inferior parietal lobe enables the brain to process information that it received from sensory input, which aids in selective attention and perception. Studies connect this lobe to the manipulation of spatial relations and the ability to sense differences between body parts (accent method¹⁶). Patients practicing with speech therapists have not achieved better results than informed patients doing the exercises individually at home. As necessary they could contact a speech therapist personally or over the phone in regard to exercise details (Table 5). The success rate of the exercise was recorder according to the scale form 1 to 5 respectively meaning no change, satisfactory voice, very satisfactory voice, excellent voice and »new« voice.

TABLE 5
EXERCISES AT HOME

Success rate	Individual exercises at home	Total
No change	3	4
Satisfactory voice	8	18
Very satisfactory voice	2	3
Excellent voice	1	3
»New« voice	1	2
Total	15	30

Conclusion

We all have »optimal« voices at birth and they change through various physical and psychological limitations¹⁷. Methods of voice disorder therapy are very complex and demand multidisciplinary approach to its application¹⁴. The appropriate use of phonation demands a higher level of event consciousness and the activation of higher speech functions of the brain¹⁸. This study indicates to the fact that treating voice as a whole is of great importance to voice therapy, which activates higher level of brain functions¹⁹.

7. MILDNER V, Govor između lijeve i desne hemisfere, (Zagreb, 1998) 28. — 8. HUNTER MD, LEE KH, TAWDON P, PARKS RW, WILKINSON ID, WOODRUFF PWR, Cereb Cortex, 18 (2007) 1295. — 9. STEMPLE JC, Semin Speech Lang, 26(2005) 131. — 10. ŠKARIĆ I, VAROŠANEC-ŠKARIĆ G, Vježbe za glas i izgovor (Nova Gorica, 1999) 197. — 11. DALHOFF K, KITZING P, Rev Laryngol Otol Rhinol, 110 (1989) 407. — 12. BEHLAU M, OLIVEIRA G, Curr Opin Otolaryngol Head Neck Surg, 17

(2009) 149. — 13. JANOVIĆ T, PEĆNJAK D, Načelo vezanost, Searle i nesvjesna intencionalnost (Prolegomena, 2007). — 14. VERDOLINI K, DRUKER DG, PALMER PM, SAMAWI H, Journal of Voice, 12 (1998) 315. — 15. THURMAN L, WELCH G, Body mind & Voice, (Iowa City, IA: National Center For Voice and Speech, 2000). — 16. PERROT-SINAL T, NEJM, 358 (2008) 2189. — 17. LYNN R, IVANEC D, ZAREVSKI P, Coll

Antropol, 33 (2009) 515. — 18. TITZE IR, Principles of Voice Production (Englewood Cliffs, NJ:Prentice Hall, 1998) 1148. — 19. KOTBY M, EL-SADY S, BASIOUNY S, ABOU-RASS Y, HEGAZI M, Journal of Voice, 5 (1991) 316. — 20. MATHIESON L, Curr Opin Otolaryngol Head Neck Surg, 35 (2009) 67.

J. Pankas

*Clinic for Otorinolaringology and Head and Neck Surgery, Rijeka University Hospital Centre, Rijeka, Croatia
e-mail: jpankas80@gmail.com*

VAŽNOST U ODABIRU TERAPIJSKIH POSTUPAKA OPORAVKA GLASA

S A Ž E T A K

Za glasovnu rehabilitaciju od velikog su značaja psihofizičko stanje pacijenta te utjecaj drugih socijalnih čimbenika. U terapiji glasa sudjeluje cijeli tim stručnjaka čija je domena glas i njegova funkcija. Napravili smo ispitivanje uspješnosti oporavka glasa s obzirom na način pristupa vokalnim problemima pacijenta. Napravljena je komparacija dviju vokalnih metoda: RVT metode i Akcentne metode. Pokušali smo ispitati klinički relevantna oštećenja glasa u relaciji s određenim vokalnim metodama. Smatramo da se o glasu može puno naučiti kroz terapijske postupke koji ujedno mogu unaprijediti praktičnu primjenu vokalnih metoda te podići razinu rada s osobama s glasovnom patologijom.