Musculoskeletal Pain and Voice-related Quality of Life in Dysphonic and Non-dysphonic Subjects

Ana Carolina Ramos, Rebeca Liaschi Floro, Vanessa Veis Ribeiro, Alcione Ghedini Brasolotto, and Kelly Cristina Alves Silverio, *Bauru, São Paulo, Brazil*

Summary: Purpose. This study aimed to compare and correlate musculoskeletal pain and voice-related quality of life of dysphonic and non-dysphonic individuals.

Method. This is a retrospective case-control study. A total of 74 adults were divided into two groups: the experimental group (EG) comprising 37 individuals with vocal complaints and hyperfunctional dysphonia, and the control group (CG) comprising 37 individuals without vocal complaints and with healthy voices. Both groups presented similar gender and age (28 females and 9 males for each group; average age = 31.5). All the participants answered the protocols: Voice-Related Quality of Life and Musculoskeletal Pain Questionnaire. Statistical data were analyzed by Mann-Whitney U test ($P \leq 0.05$) and Spearman correlation test ($P \leq 0.05$).

Results. It was observed that the EG presented significantly lower scores of voice-related quality of life in the social-emotional ($P < 0.001$), physical ($P < 0.001$), and total ($P < 0.001$) fields. Concerning musculoskeletal pain, it was observed in the EG that there was a higher intensity in pain in the region of the larynx ($P < 0.001$), and a higher frequency of pain in the submandibular ($P = 0.013$), larynx ($P < 0.001$), and front of the neck ($P = 0.002$) regions, when compared with the CG.

Conclusion. In the group of individuals studied, worst indexes of voice-related quality of life and higher frequency and intensity of pain in the larynx were observed, in addition to higher frequency of pain in regions near the larynx in dysphonic subjects. There was correlation between voice-related quality of life and the frequency and intensity of musculoskeletal pain.

Key Words: Dysphonia–Pain–Quality of life–Voice–Voice disorders.

INTRODUCTION

The voice is one of the most important human communication tools. It transmits the emotional message, identifies the subject in their context, and enables effective communication. It is considered adequate if its quality is socially acceptable; if it is according to the age, gender, and speaker's environment; and if it does not interfere with the speaker's speech intelligibility.[1] Whenever there is some difficulty in natural voice production, discomfort, or pain during the emission, there is a diagnosis of dysphonia.[1]

Hyperfunctional dysphonia can present motor adjustments as well as inadequate vocal habits and health.[2–4] Such behaviors can generate discomfort or musculoskeletal pain, particularly in the cervical region and shoulder girdle, and limit individuals' vocal performance.[5–8] In addition, the literature reveals that the pain related to phonation is among the most common complaints of subjects with hyperfunctional dysphonia, whose presence of musculoskeletal tension in the region of the shoulder girdle can present itself as an associated diagnosis.[9] Thus, there seems to be a difference in the muscle pattern, with higher frequency of musculoskeletal changes in dysphonic subjects, when compared with the vocally healthy ones.[10]

A study of subjects who use the voice professionally, specifically telephone operators, shows a higher incidence of musculoskeletal pain in the shoulders and neck when compared with the general population. The authors concluded that these professionals present with great physical and vocal fatigue, suffer more from musculoskeletal pain, and have greater need to stay away from work as a result of these factors.[11] Another study revealed that dysphonic subjects present with higher frequency of musculoskeletal pain in the submandibular region, larynx, anterior and posterior regions of the neck, shoulders, and upper back, and higher intensity of pain in the back of the neck and laryngeal region than subjects with normal voices and without vocal complaints.[8] In this way, Brazilian studies corroborate the international literature by affirming that the general population presents musculoskeletal pain, but that dysphonic subjects have a higher frequency and intensity of pain in regions near the larynx.

Musculoskeletal pain is a consequence of repetitive strain, voice overuse, and musculoskeletal disorders related to professional activities, and can be considered one of the biggest health problems of the modern world.[11] Authors show that musculoskeletal pain may reduce functionality of subjects in daily activities and is thus an important factor that affects the quality of life of subjects.[7,12] A study analyzed the association between health-related quality of life and pain in 304 subjects divided into 3 groups: diffuse and chronic pain, regional pain, and sporadic pain. The results showed that 35% of the sample claimed to have diffuse and chronic pain, constituting the largest group. The subjects with diffuse and chronic pain presented with the most intense symptoms and worse quality of life, and such quality was shown to be negatively correlated with pain. Thus, the authors

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From the Speech-Language Pathology and Audiology Department, Bauru School of Dentistry, University of São Paulo—FOB/USP, Bauru, São Paulo, Brazil.

Address correspondence and reprint requests to Kelly Cristina Alves Silverio, Department of Speech Hearing and Language Disorders, School of Dentistry of Bauru, University of São Paulo, Al. Dr. Octávio Pinheiro Brisolla, 9-75, 17012-901 Bauru, SP, Brazil. E-mail: kellysilverio@usp.br

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concluded that the frequency of pain influences the quality of life and affects it significantly.[7]

In the field of voice, literature brings a large number of studies that have associated or correlated quality of life with various topics related to voice. Some of them stand out: vocal disorders,[13] vocal self-perception,[14,15] voice handicap,[16] and body discomforts.[17] However, studies that associate musculoskeletal pain with the quality of life of subjects with behavioral dysphonia have not been explored. Based on this information, it appears that there is a need to better understand the influence of musculoskeletal pain on the quality of life of dysphonic subjects, by using scientific evidence. It is believed that such data may contribute to clinical practice for a better conduction of objectives and specific therapeutic strategies for cases of behavioral dysphonia with musculoskeletal pain complaints.

This being the case, the hypothesis of this study is that dysphonic subjects have higher frequency and intensity of musculoskeletal pain in regions near the larynx and lower quality of life than subjects with normal voices. In addition, it is believed that musculoskeletal pain in regions near the larynx influences negatively the quality of life of dysphonic subjects.

Therefore, the objective of this study was to compare and correlate musculoskeletal pain and voice-related quality of life of dysphonic and non-dysphonic subjects.

MATERIALS AND METHODS

Type of study

This is a case-control, retrospective study.

Ethical aspects

The survey was conducted in conformity with resolution number 466/12 of the National Health Council and was approved by the Research Ethics Committee of the institution of origin (number 1.357.432). To collect data of subjects from the voice sector database of a Speech, Language and Hearing Sciences School Clinic from the countryside of the State of São Paulo, subjects did not have to sign the informed consent form because previously, they had already signed a permission form that allows the use of data in scientific research. The other subjects received an explanation about the research and signed the informed consent form.

Sample

To form the sample of this study, two groups were established: the experimental group (EG), formed by subjects with vocal complaints and diagnosis of hyperfunctional dysphonia, and the control group (CG), formed by subjects without vocal complaints and with healthy voices.

The general criteria for inclusion were individuals of both genders aged from 18 to 45. The criteria for the EG were individuals with clinical history of vocal misuse, muscle tension dysphonia, vocal or laryngeal symptoms, and benign lesion in the larynx. The criteria for the CG were no vocal complaints, no history of dysphonia, or no treatment for voice or larynx in the past. We excluded individuals who presented in their medical record evidence of laryngopharyngeal reflux; neurologic, hormonal, syndromic, psychiatric, allergic, or rheumatologic diseases; or declared use of medicines for musculoskeletal pain or smoking.

To apply the selection criteria, the data of the questionnaire identification (identification data, vocal health, and general health) were analyzed and applied with standardized orders to the participants from the two groups.

To constitute the EG, we used data of individuals with otorhinolaryngologic and vocal diagnoses of hyperfunctional dysphonia assisted from January 1, 2013 to November 30, 2015, which were available on the voice sector database of a Speech, Language and Hearing Sciences School Clinic from the University.

The CG was composed of subjects without vocal complaints and with healthy voices. Community members and companions of patients from the Speech, Language and Hearing Sciences School Clinic were invited to participate in this group.

All the subjects had their voices recorded in the voice studio of the Speech, Language and Hearing Sciences School Clinic (/a/ vowel sustained and counting from 1 to 10) for hearing-perceptive analysis of vocal quality. This analysis was performed by three judges—speech therapists and voice specialists. The judgment of the voices was based on the global degree of vocal quality (G) of the GRBAS scale.[18] The GRBAS scale was chosen for being an internationally recognized instrument for perceptive-hearing analysis of vocal quality. The letter "G" of the scale represents overall degree of vocal deviation of vocal quality. Each parameter of this scale receives a rating for the degree of deviation: normal (0), mild (1), moderate (2), and severe (3). Therefore, three judges classified the overall degree of vocal deviation based on the sustained vowel /a/ phonation and the counting. The voices with deviation from "0" and "1" were considered healthy voices and the voices with deviation from "2" and "3" were classified dysphonic voices.[19] If the judges did not agree completely about the grade of vocal deviation, the mode math was considered to result. There was no vocal deviation that the judges disagreed completely. The kappa test was applied to verify intra-judge reliability. The values found for intra-judge reliability were from 0.6 to 1.0.

For the EG alone, the information on laryngology examinations was considered.

The database consisted of 69 individuals. After applying the exclusion criteria, 12 individuals were excluded. Therefore, 57 individuals were eligible to the EG. The data of EG participants were tabulated alphabetically in a *Microsoft Office Excel* (software Microsoft Excel 2013, Microsoft Corporation) 2013 spreadsheet. Using a randomization process, a new order (numerical) was established by the same program. After excluding 1 in 3 individuals, a total of 19 individuals were excluded by the randomization process.

The number of volunteers from the CG was matched in number, age, and gender, according to the EG participants.

Thus, the final sample of this study consisted of 76 subjects: 38 individuals with hyperfunctional dysphonia comprising the EG, and another 38 individuals without vocal complaints and with healthy voices comprising the CG. Both groups were formed by 29 women and 9 men, with average age of 31.5.