Correlação entre dados perceptivo-auditivos e qualidade de vida em voz de idosas****

Correlation between acoustic-perceptual data and voice-related quality of life in elderly women

Ana Cristina Côrtes Gama*
Cláudia Fernanda Tolentino Alves**
Janaína da Silva Berto Cerceau**
Letícia Caldas Teixeira***

*Fonoaudióloga. Doutora em Distúrbios da Comunicação Humana pela Universidade Federal de São Paulo. Professora do Departamento de Fonoaudiologia da Universidade Federal de Minas Gerais. Endereço para correspondência: Av. Alfredo Balena, 190 – Sala 69 – Belo Horizonte – MG – CEP 30130-100 (anacgama@medicina.ufmg.br).

**Fonoaudióloga Clínica.

***Fonoaudióloga. Mestre em Educação pela Universidade Federal de Minas Gerais. Professora do Departamento de Fonoaudiologia da Universidade Federal de Minas Gerais.

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Abstract

Background: vocal quality and voice-related quality of life in elderly women Aim: to assess the vocal quality and voice-related quality of life in elderly women, as well as verify if the presence of dysphonia has an influence on the life quality of these women. Methods: one hundred and three elderly women, with ages ranging from 60 to 103 years, were recruited. The V-RQOL was answered by the participants and their voices were registered and analyzed perceptually by five experienced speech pathologists, using the GRBASI scale. After the intra-rater reliability analysis, three speech pathologists were selected with whom a single GRBASI scale was built for each of the participant's voice. Later, this single assessment was compared to the physical, socio-emotional and total V-RQOL scores. Results: most of the elderly women presented V-RQOL total scores between 70 and 100. They also presented a mild to moderate vocal disorder in the overall scores related to dysphonia, roughness, breathiness and instability in the GRBASI scale and did not present scores related to asthenia or strain. The G, R, B and I parameters of the GRBASI scale were statistically correlated to the physical and total V-RQOL scores. Conclusions: although most of the elderly women presented some level of dysphonia, the vocal disorders did not have an influence on their life quality. However, the physical and total V-RQOL scores were correlated to dysphonia severity, indicating that the more sever the dysphonia, the lower the voice-related quality of life.

Key Words: Voice; Voice Quality; Quality of Life; Aged.

Resumo

Tema: qualidade da voz e qualidade de vida em idosas. Objetivo: avaliar a qualidade vocal e a qualidade de vida relacionada à voz em idosas, bem como verificar se a presença ou não da disfonia influi na qualidade de vida dessas mulheres. Métodos: trata-se de um estudo realizado com 103 idosas de 60 a 103 anos. As participantes responderam ao Questionário de Qualidade de Vida Relacionada à Voz (QVV), suas vozes foram registradas e analisadas perceptivo-auditivamente, por meio da escala GRBASI, por 5 fonoaudiólogas. Após a análise estatística da confiabilidade intra-examinadoras, foram selecionadas 3 avaliações, com as quais foi construída uma escala GRBASI única para a voz de cada idosa. Posteriormente, essa avaliação única foi comparada aos escores físico, sócio-emocional e total do QVV. Resultados: a maioria das idosas apresentou escores do QVV entre 70 e 100. As senhoras apresentaram grau de alteração leve a moderado nos parâmetros grau geral de disfonia, rugosidade, soprosidade e instabilidade da escala GRBASI e não apresentaram nenhum grau de alteração nos parâmetros astenia e tensão. Os parâmetros G, R, B e I da escala GRBASI aparecem estatisticamente correlacionados aos escores físico e total do QVV. Conclusão: Apesar da maioria das idosas apresentarem algum grau de disfonia, a alteração vocal não impactou a qualidade de vida das idosas. No entanto, os valores dos escores físico e total do QVV se correlacionaram com o grau de severidade da disfonia, indicando que quanto mais severa é a disfonia, menor é a qualidade de vida relacionada à voz.

Palavras-Chave: Voz; Qualidade da Voz; Qualidade de Vida; Idoso.

Introduction

The elderly population is currently constantly increasing. Life expectancy grows and pushes the entire society - especially the area of health related to improvements in the quality of life of this population.

Aging brings a number of corporal changes. Many of these modifications are accompanied by the aging of the voice, which is conceptually named presbyphonia (1). The vocal quality changes most commonly found in elderly women are a decrease in fundamental frequency with a pitch decrease (1,2,3), increase in hoarseness/ roughness (2,3,4,5,6,7,8), presence of instability (4.9), decreased vocal intensity (5.10) and presence of breathiness (2,5,10).

Such voice alterations considerably influence the process of personal identity construction and may be a conflict factor, particularly for women who use their voice professionally (11).

Despite the advent of acoustic analysis, the auditory-perceptual analysis is still sovereign in the evaluation of voice quality as it provides information on biological, psychological and social aspects. Among the scales of voice perceptual evaluation, the GRBASI scale (12) is internationally utilized and recognized.

Although the perceptive-auditory analysis is of paramount importance in voice evaluation, it is known that the degree of dysphonia is not directly proportional to the impact that this one exerts on the life of the dysphonic individual. For this purpose one can use the Questionnaire of Quality of Life related to Voice (QQL) (13.14).

Although there are many papers describing voice in elderly, few studies correlate the quality of voice with the quality of life. This paper aims to describe the voice quality and the quality of life related to voice in elderly women as well as to correlate whether the presence or absence of dysphonia affects the quality of life of these individuals.

Method

This study was approved by the Research Ethics Committee of the Federal University of Minas Gerais under review number ETIC 0375/06.

A cross-sectional observational study was conducted with 103 elderly women with ages between 60 and 103 years as participants. To calculate the sample size, an estimate error of 10% and a significance level of 95% were used. This estimated a minimum of 96 participants.

Participants were recruited from on an elderly recreation center. The inclusion criterion was the presence of age equal or superior to 60 years and the exclusion criterion was the presence of cognitive impairment that would disable the participant to respond to the QQL. All participants signed the Free and Informed Consent Form agreeing to participate in the study and to the dissemination of results.

The QQL is a voice self-evaluation protocol linked to aspects of quality of life related to voice. It has ten items, six of physical domain and four of socio-emotional domain. The affirmatives of this protocol are straightforward and the time required to fill it is short. The protocol provides a total score (ranging from 0 to 100, where 0 indicates worst quality of life and 100 indicates better quality of life) as well as a score for each domain. Participants answered the QQL14 version validated for the Brazilian Portuguese which was read by the participants along with one of the researchers.

Voice recording of each participant was made by means of a Shure ® unidirectional condenser microphone, at 10 centimeters from the participant with capture angle of 45 °, coupled to a sound table from MACKIE 1202 VLZ ™ - 12 channels. The registration was conducted on a professional digital recorder from Sony ™ in a quiet environment (less than 50 dBNPS of noise - measured by a Radio Shack ™ sound level meter).

The recording was carried out with the participant seated. They were required to produce the long vowel /a/ three times as naturally as possible. From these emissions, only one was selected for the judgment on the auditory-perceptive analysis. For this selection, the first emission was used as a criterion. In the case of this one being produced in an inappropriate manner or having external interference during recording, the productions were considered in succession, with preference for the second production, and only when this one was inappropriate, the third one was considered. Participants were also asked to say the days of the week and the numbers from one to twenty for the sequential speech analysis.

The recorded voices were transferred and edited on CD on an AMD Athlon ™ XP2800 +, 1.67 GHz, 256 MB RAM computer with sound card from SoundMAX Integrated Digital Audio. The Sound Recorder program in Windows XP was used for voice recording. The files were transferred to wave extension with sampling rate of 22050kHz PCM, 16 Bit, Mono, and recorded on a speed of 43 kb/s.

Subsequently, those samples were analyzed perceptual-auditorily by five Speech-Language Pathologists specialized in voice on the GRBASI scale (12). The Speech-Language Pathologists also

signed the Free and Informed Consent Form agreeing to the participation and to the dissemination of results.

We used a CCE® microsystem, model CS 3600, for presentation of the samples to the Speech-Language Pathologists who individually performed the perceptual-auditory assessment in a quiet environment. For evaluation, 123 samples were presented, being 103 voices of participants and 20 repeated voices for subsequent analysis of reliability examination. An anchor female voice - whose voice quality was neutral - was presented at each ten participants voices in order for the examiner to have a normality reference.

The reliability values used to determine the intra-examiner agreement were determined by calculating the Kappa coefficient.

The assessments from three Speech-Language Pathologists who obtained a rating of "very high reliability" in four or more parameters evaluated by GRBASI scale were selected. These three evaluations were used on the construction of a GRBASI scale specific for the voice of each participant. For such, the severity rating of higher incidence, or the mean of the three ratings for each

parameter of the scale GRBASI, was used. Subsequently, this specific assessment was compared to physical, social and emotional scores and to the total score of the QQL.

To verify the correlations between QQL and the auditory-perceptual parameters of the GRBASI scale the Spearmam correlation coefficient was calculated. The statistical software Minitab version 14 was used on the analysis. The level of significance adopted was of 0.05.

Results

Participants presented the following distribution by age group: 54 (52.43%) participants from 60 to 69 years of age, 31 (30.09%) participants from 70 to 79 years of age, and 18 (17.48%) participants with more than 80 years of age. The results of the perceptive-auditory analysis by the GRBASI scale are in Table 1.

The QQL values are in Table 2. In Table 3 we observe a negative correlation between the parameters of the GRBASI scale and the QQL domains.

TABLE 1. Distribution of parameters G, R, B, A, S and i by severity level assessed through the GRBASI scale.

Severity Level	G		R		B		A		S		I	
	N	%	N	%	N	%	N	%	N	%	N	%
0	1	0,97	12	11,65	6	5,82	75	72,82	77	74,76	5	4,85
1	48	46,60	62	60,19	84	81,56	18	17,48	21	20,39	66	64,08
2	46	44,66	28	27,19	13	12,62	10	9,70	5	4,85	31	30,10
3	8	7,77	1	0,97	0	0,00	0	0,00	0	0,00	1	0,97

Note: G = Disphony degree; R = Roughness; B = Breathiness; A = Asthenia; S = Tension; I = Instability; N = Number.

TABLE 2. Distribution of total QQL score by score intervals.

QQL Interval Scores	Total Score	
	N	%
100-90	75	72,82%
89-70	21	20,39%
69-50	6	5,82%
49-30	1	0,97%

Note: N = Number of scores.

TABELA 3. Correlation between the parameters evaluated by the GRBASI scale and the socio-emotional, physical and total domains of QQL.

Parameter		SE	Physical	Total
G	Correlation Coefficient	-0,114	-0,185	-0,173
	p-value	0,127	0,031*	0,041*
R	Correlation Coefficient	-0,144	-0,217	-0,228
	p-value	0,075	0,014*	0,011*
B	Correlation Coefficient	-0,144	-0,243	-0,243
	p-value	0,073	0,007*	0,007*
A	Correlation Coefficient	-0,062	-0,080	-0,087
	p-value	0,266	0,210	0,191
S	Correlation Coefficient	0,090	-0,038	-0,009
	p-value	0,182	0,351	0,465
I	Correlation Coefficient	-0,116	-0,208	-0,197
	p-value	0,123	0,018*	0,024*

Note: SE = QQL socio-emotional domain; * = p-value < 0,05.

Discussion

Vocal quality changes most commonly found in elderly women are a decrease in fundamental frequency with a pitch decrease (1,2,3), increase in hoarseness/ roughness (2,3,4,5,6,7,8), presence of instability (4.9), decreased vocal intensity (5,10) and presence of breathiness (2,5,10).

Such voice alterations considerably influence the process of construction of personal identity and may be a conflict factor, particularly for women who use their voice professionally (11).

In the present paper, dysphonia of mild level was observed in 46.60% and of moderate level in 44.66% of the participants, as shown in table 2.

Table 1 shows that most participants had their degree of voice roughness classified between mild and moderate. This fact is in agreement with the literature, which points to an increase in roughness with aging (2,3,4,5,6,7,8,16).

Regarding breathiness, there is a predominance of classification as mild, which agrees with a study in which authors affirm that the elderly tend to have voices perceived as slightly breathy (2). Other studies also report the presence of breathiness in the voice of older people although they do not classify its severity (5.10). A study did not found presence of breathiness in young and elder women, however, the evaluators were lay judges, which may explain such finding (7).

The fatigued vocal behavior is a factor behind the hypofunction that, in turn, may be related to an organic or not alteration (17). It can be observed in Table 1 that the majority of participants of the present study (72.82%) did not present any degree of voice fatigue.

Some literature findings refer that the laryngeal alterations that occur with aging causes an increase on the larynx adductor forces in order to compensate for the incomplete glottic closure in elderly (3,9,18). However, one can observe that much of the study sample (74.76%) did not present any degree of voice tension. Thus, one can infer that despite the existence of vocal compensatory adjustments, they were not sufficient to promote tension in the auditory perception of voice quality.

The mild instability was present in 64.08% of evaluated voices, followed by a moderate instability, evidenced in 30.10% of evaluated voices. Such findings corroborate to the literature which indicates that there is a decrease in the stability of speech production in elderly in function of muscle, tissue and the respiratory system modifications (4,9).

It is known that the impact that dysphonia causes in the life of an individual has no direct relationship with the degree of alteration of voice quality or even with the imaging of the larynx (19). Thus, measuring only the degree of voice alteration is not sufficient to provide information on the impact of dysphonia (13).

Researchers verified that the presence of a voice disorder negatively impacts on quality of life of seniors, but, not necessarily, causes avoidance of social activities (20). However, other authors, when studying the impact of voice on the quality of life of elderly women, found that voice changes resulting from aging lead to limitations in carrying out daily physical tasks (21).

In the present study, we found that most of the elderly women present quality of life related to voice, with total score between 70 and 100 (93.21%), as shown in table 2. Thus, we can infer that although the majority of participants have some degree of dysphonia, this did not affect the quality of life of elderly. A study conducted with an elderly population found similar results and showed that 87% of the sample had total score of QQL between 75 and 100 (22). Another study using the IDV in elderly women found that 80% of women presented total score between 0 and 12 points, meaning that they felt their voices appropriate to their daily activities (21).

Another study observed that individuals with vocal complaints presented QQL scores lower than when compared to individuals without vocal complaints - which may also explain the results of the present study once the sample consisted mostly in healthy elderly women without vocal complaints (23). The fact that voice complaint was not initially considered as an inclusion or exclusion in the present study factor should be highlighted. However, we verified at data analysis that 93.2% of the participants had no vocal complaints, while 6.8% of the participants had vocal complaints. Future studies should be encouraged in order to better clarify this issue and to provide greater knowledge on these aspects.

Another important factor to be considered is the fact that participants do not professionally use their voice, once the sample of this research consists mostly of retired participants. The literature indicates that patients who present greater use of voice have worse quality of life as compared to those who have small voice demands (19). Other researchers found that the quality of life related to voice in individuals with over 66 years was better when compared to that of individuals with less than 66 years - they also attribute this finding to the professional activity (24).

Although the participants do not consider their voices as a factor for the loss of quality of life, it was evidenced in this study that the degree of severity of dysphonia is related to this loss of life quality. In Table 3 we can observe that the parameters G, R, B and I of the GRBASI scale appear negatively correlated to physical and total QQL scores. This indicates that the more altered the vocal quality is, the greater the impact on life quality related to voice is going to be. Some authors, when comparing the GRBASI scale to the QQL, also found that the worse the voice quality, the worse the quality of life is (23,24). Although this correlation between the parameters G, R, B and I of the GRBASI scale and the physical and total scores of QQL exists, results showed that the aspects related to vocal quality were not sufficient to negatively impact on the quality of life of elderly women.

Some authors found that of the elderly who presented voice disorder at the moment of completion of the study, only 14.6% had thought about professional help as a solution to the vocal problem (20). Another study shows that many elderly patients who presented some degree of dysphonia tend to believe that voice problems are part of normal aging (22). Our findings also agree with these studies, once the degrees of alteration mild/moderate found on the parameters of the GRBASI scale were not sufficient to negatively impact the quality of life of the elderly participants.

Studies that assess the prevalence, risk factors and impact of voice disorders on quality of life in the elderly population are important so that strategies to develop promotion, prevention and treatment of presbyphonia can be created.

Conclusion

The elderly women presented degree of alteration from mild to moderate on the overall parameters of dysphonia, roughness, breathiness and instability of the GRBASI scale and showed no negative impact on quality of life related to voice.

The values of physical and total QQL scores showed correlation with dysphonia severity degree evaluated through the GRBASI scale.

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Anexo

Valores da média e desvio-padrão da concordância intra-avaliador na análise perceptivo-auditiva para cada parâmetro da escala GRBASI.

Parâmetros		Avaliadores				
		A**	B**	C	D**	E
G	MDA	0,500*	0,550	0,750	0,450*	0,600
	desvio padrão	0,513	0,605	0,639	0,510	0,598
R	MDA	0,450*	0,450*	0,850	0,450*	0,800
	desvio padrão	0,605	0,605	0,875	0,605	0,616
B	MDA	0,450*	0,450*	0,750	0,500*	0,450*
	desvio padrão	0,510	0,510	0,550	0,513	0,510
A	MDA	0,350*	0,300*	0,750	0,750	0,050*
	desvio padrão	0,671	0,571	0,639	0,786	0,2236
S	MDA	0,350*	0,400*	0,300*	0,500*	0,250*
	desvio padrão	0,489	0,503	0,657	0,688	0,639
I	MDA	0,600	0,500*	0,650	0,800	0,600
	desvio padrão	0,503	0,607	0,813	0,616	0,598

Legenda: MDA = média das diferenças absolutas. * = média das diferenças absolutas com classificação de "confiabilidade muito boa" (MDA entre 0 e 0,5). ** = fonoaudiólogo selecionado.

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