

Brief communication

Voice-related quality of life in patients pre thyroidectomy

Qualidade de vida em voz de pacientes no pré-operatório de tireoidectomia

Marilu Rita Villa Koga⁽¹⁾
Ana Paula Dassie Leite⁽²⁾
Vanessa Veis Ribeiro⁽³⁾

⁽¹⁾ Hospital das Clínicas da Universidade Federal do Paraná - HC-UFPR - Curitiba (PR), Brasil.

⁽²⁾ Departamento de Fonoaudiologia da Universidade Estadual do Centro-Oeste - UNICENTRO - Irati (PR), Brasil.

⁽³⁾ Faculdade de Odontologia de Bauru, Universidade de São Paulo - FOB/USP - Bauru (SP), Brasil.

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ABSTRACT

Purpose: to evaluate the quality of life in voice individuals submitted to thyroidectomy prior to the procedure. **Methods:** the study included female patients of a reference hospital referred for thyroid or gallstone surgery. Subjects were divided into: Study Group - 30 women (mean 44.26 years) referred for partial or total thyroidectomy surgery; Control Group - 30 women (mean 45.3 years), forwarded to gallstone surgery. The participants answered a screening questionnaire and Voice-Related Quality of Life. Data were statistically analyzed by the Fisher Two Tailed Test, Student's T Test and Pearson correlation coefficient, adopting a significance level of 5%. **Results:** there was a higher incidence of vocal complaints (48,3%), and lower scores for quality of life in voice in all areas in the study group than in the control group. In the exclusive analysis to the study group, it was observed that the physical domain was the most affected, with difference to the social-emotional domain ($p=0,002$), there is still strong positive correlation between the scores of the two domains ($r=0,047$; $p<0,001$). **Conclusion:** it is concluded that the group of women with thyroid diseases pre-thyroidectomy has a negative impact on quality of life in voice, especially when it comes to the physical domain, and as the physical affections related to voice happen, there are influences on the social-emotional domain.

Keywords: Health Evaluation; Quality of Life; Thyroidectomy; Voice.

RESUMO

Objetivo: avaliar a qualidade de vida em voz de indivíduos encaminhados à tireoidectomia, antes da realização do procedimento. **Métodos:** participaram do presente estudo pacientes do sexo feminino de um hospital de referência encaminhados para cirurgia de tireoide ou colelitíase. Os indivíduos foram subdivididos em: Grupo Estudo - 30 mulheres (média de 44,26 anos), encaminhadas para cirurgia de tireoidectomia parcial ou total; Grupo Controle - 30 mulheres (média de 45,3 anos), encaminhadas para cirurgia de colelitíase. Os participantes responderam um questionário de triagem e ao protocolo Qualidade de Vida em Voz. Os dados foram analisados estatisticamente por meio dos testes Fisher Two Tailed, Teste T de Student e coeficiente de correlação de Pearson, adotando-se nível de significância de 5%. **Resultados:** houve maior ocorrência de queixa vocal (48,3%), e escores inferiores de qualidade de vida em voz em todos os domínios no grupo estudo, que no grupo controle. Na análise exclusiva ao grupo estudo, observou-se que o domínio físico foi o mais afetado, com diferença em relação ao domínio socioemocional ($p=0,002$), havendo ainda correlação positiva forte entre os escores dos dois domínios ($r=0,047$; $p<0,001$). **Conclusão:** conclui-se que o grupo de mulheres com doenças tireoidianas pré-tireoidectomia estudado apresenta impacto negativo na qualidade de vida em voz, principalmente no que se refere ao domínio físico, sendo que à medida que os acometimentos físicos relacionados à voz acontecem, há acometimento do domínio socioemocional.

Descritores: Avaliação em Saúde; Qualidade de Vida; Tireoidectomia; Voz

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Mailing address:

Vanessa Veis Ribeiro
Rua Padre João, nº 15-82
Vila Universitária - Bauru - SP
CEP: 17012-020
E-mail: vanessaribeiroo@hotmail.com

INTRODUCTION

Thyroidectomy, the surgery to partially or total removing the thyroid, may cause voice deviations^{1,2} with the manipulation of the larynx nerves close to thyroid, or other factors as the used technique in surgery and intubation³. But, in Speech-Language clinic practice, before the surgery procedure, is already observed the diseases associated to thyroid causing complaints of voice of endocrine etiology^{1,4,5}.

These complaints are due to several factors: for instance, in hypothyroidism the increase of hyaluronic acid in vocal folds lamina propria may lead to fluid retention and thickening of vocal folds⁶; in hyperthyroidism the results are believed to be resultant of the decrease in sub-glottic pressure caused by the weakness of breathing muscles,⁷ and in diseases with the abnormal growth of thyroid the dysphonia may be caused by pressing the larynx nerve^{8,9}.

Some researches were already developed to evaluate the voice disorders faced by adult patients with thyroid disorders. In general, roughness, low voice, weak voice, strain while speaking, and deviated acoustic measures were observed¹⁰⁻¹².

However, there are still few information about the voice self-assessment and quality of life of subjects with dysphonia caused by thyroid disease, even before thyroidectomy^{5,13}. This result may have big importance to designing clinic actions to this population, whether necessary.

Therefore, the purpose to the current study was to assess the voice-related quality of life of patients with indication of thyroidectomy, before the surgery procedure.

METHODS

This was a cross sectional observational and quantitative study. The research was carried out according to the recommendations of the 466/12 rule from the National Committee of Ethics in Research (*Comissão Nacional de Ética em Pesquisa*), and approved by the Ethic in Research Committee from *Hospital das Clínicas* from *Universidade Federal do Paraná*, under protocol number 2193.087/2010-04.

The target-population was female, from 18 to 59 years, patients of reference hospital placed in *Curitiba/Paraná-Brazil*. The subjects were divided in two groups: Experimental Group (EG) – 30 women with indication of partial or total thyroidectomy; Control Group (CG) – 30 women with indication of cholelithiasis (gallstones). The

option for the gallstones disease to CG was made due to lack of injury or symptoms related to phonation in literature^{14,15}.

The participants were invited to join the research at the hospital, in the booking surgery department, when identifying one of the two surgeries, quoted above, besides the invitation, an explanation of the research purposes and clarifying doubts were made, followed by the informed consent signed by the patient.

Were exclusion criteria for both groups: smoking history (past or present), benign or malign lesion in vocal folds history, hearing complaint, neurologic or psychiatric disorders history, professional voice use in the elite voice professional categories and speaking voice professional¹⁶. To EG were excluded yet the participants that have already had partial thyroidectomy or previous iodotherapy, or voice complaint for a long time before the thyroid disease diagnosis. Were admitted, for both groups, participants just having co-morbidities without direct relation to voice disorders (arterial hypertension – n=1 in CG and n=1 in EG; diabetes – n=1 in CG; and rheumatoid arthritis – n=1 in CG).

In order to apply the inclusion and exclusion criteria, the subjects answered to a screening questionnaire made by the researchers with the following data: identification, general health, presence or absence of vocal complaint, physician diagnosis of thyroid disturbance. After the screening, the subjects were addressed the Voice-Related Quality of Life questionnaire (V-RQOL). The questionnaire has ten questions divided in three domains: socio-emotional, physical, and total. The patients were guided to read each question and sign, using Likert scale of five point, how the sentence negatively impact the quality of life, as one stating “not a problem” and five stating “problem is ‘as bad as it can be’”. The calculus is performed using a specific algorithm and maximum punctuation is 100 points¹⁷. The most sensitive and specificity cohort point is 91.25¹⁸ to detect subjects with and without health voices, and as higher the punctuation higher the voice-related quality of life¹⁷.

Data were charted and the variables were statistically analyzed. To compare the groups regarding voice complaint the Two Tailed Fisher test was used. The t-student test was used in the comparison of groups regarding the mean scores in three domains, after normality distribution. Regarding the analysis performed exclusively to EG, the t-student Test was used to compare the physical and socio-emotional

domains means of V-RQOL, and the Pearson correlation coefficient was used to correlate the scores of these domains. The significance level adopted to all analysis was 5%.

RESULTS

Mean age of EG participants was 44.26 years, and CG was 45.3 years, without differences between groups ($p=.631$). Regarding the thyroid disease diagnosis in

EG ($n=30$), 56.7% of participants ($n=17$) had multinodular goiter, 16.7% ($n=5$) had follicular lesion, 10% ($n=3$) had papillary thyroid carcinoma, 6.7% ($n=2$) toxic multinodular goiter, 6.7% ($n=2$) graves disease, and 3.3% ($n=1$) multinodular goiter.

The results showed more voice complaint in EG than CG ($p<.001$) – Table 1. In addition, the voice-related quality of life scores were lower in EG to all domains: physical ($p<.001$), socio-emotional ($p=.002$), and total ($p<.001$) – Table 2.

Table 1. Comparison of subjects regarding the presence of voice complaint in pre thyroid surgery and cholelithiasis

Group	Analysis	Vocal complaints		P
		Yes	No	
CG	N	16	14	<0.001
	%	26.7%	23.3%	
EG	N	29	1	
	%	48.3%	1.7%	

*Statistical significant values ($p\leq 0.05$) – Two tailed fisher test

Subtitles: n= subjects number; %= subjects percentage; EG = experimental group; CG= control group

Table 2. Comparison of subjects regarding the voice-related quality of life scores in pre thyroid surgery and cholelithiasis

Domain	CG			EG			P
	Mean	Median	SD	Mean	Median	SD	
Socio-emotional	99.58	100.00	2.28	83.54	100.00	27.33	0.002
Physical	96.11	100.00	8.26	74.44	83.30	25.86	<0.001
Total	97.50	100.00	5.76	78.25	87.50	25.28	<0.001

*Statistical significant values ($p\leq 0.05$) – T-student Test

Subtitles: EG = experimental group; CG= control group; SD=standard deviation

Analyzing exclusively the EG, it was observed the physical domain was the most impaired compared to the socio-emotional domain ($p=.002$) – Table 3.

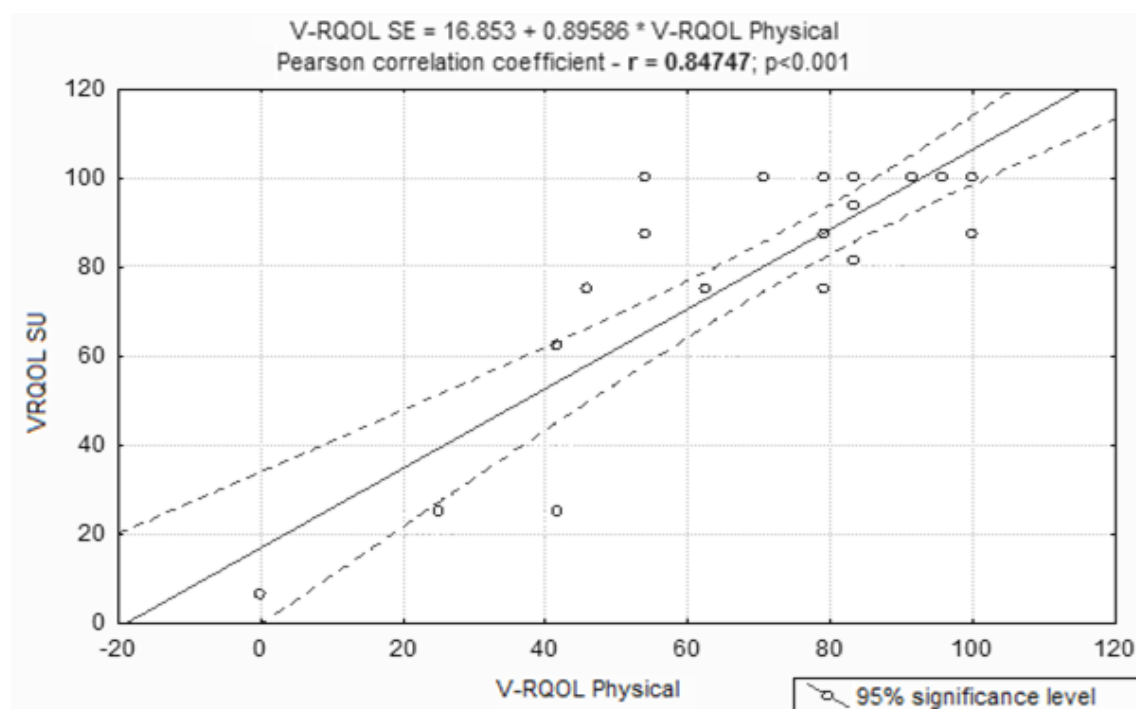
There was yet the positive and strong correlation of the physical and socio-emotional domains scores of V-RQOL ($r=.847$, $p<.001$) – Figure 1.

Table 3. Comparison of the physical and socio-emotional domains in subjects' pre thyroid surgery

Domain	CG			P
	Mean	Median	SD	
Socio-emotional	83.54	100.00	27.33	0.002
Physical	74.44	83.30	25.86	

*Statistical significant values ($p\leq 0.05$) – T-student Test

Subtitles: EG = experimental group; CG= control group; SD=standard deviation



*Statistical significant values ($p \leq 0.05$) – Pearson correlation coefficient

Subtitles: V-RQOL SE= socio-emotional domain of voice-related quality of life; V-RQOL Physical= physical domain of voice-related quality of life

Figure 1. Correlation between the physical and socio-emotional scores of voice-related quality of life in subjects' pre thyroid surgery

DISCUSSION

Quality of life study in subjects before thyroidectomy surgery is extremely relevant and has already been highlighted in literature as parameter of social, physical, and emotional context perception, and it is considered important factor to assess the survival conditions, especially in long term¹⁹.

Voice-related quality of life deviations may be present due to voice and larynx diseases there are many times detected before the surgery procedure²⁰. Therefore it is important before the surgery to perform a laryngoscope, and, in some cases which the immobility is observed, is also recommended to perform larynx electromyography, seeking to distinguish immobility cases from palsy using electric activity monitoring^{21,22}. Vocal fold immobility may be present before surgery due to neural commitment or vocal fold mechanic fixation, which may be finding in cases with tumor invasion of lamina propria and vocal muscle, or by muscle fixation²⁰.

The voice complaint was significantly higher in subjects' pre thyroidectomy (Table 1). These findings corroborates other studies that show high levels of voice complaint in subjects with thyroid diseases^{1,5,23},

but, literature point out even asymptomatic subjects may have vocal fold immobility before surgery²⁴.

It is believed the big occurrence of voice complaint in subjects' pre thyroidectomy happens because, according to literature, regardless the thyroid disease type, it may have physiologic disturbances related to phonation system, whether in voice or breathing level⁵⁻⁹. Among the main voice disorders present in thyroid diseases, the most common are: decrease of loudness, vocal fatigue, decrease of fundamental frequency (especially in women), roughness, instability, and breathiness²⁵.

A research looking to characterize the communication disorders associated to thyroid diseases in 48 subjects, with indication of thyroid surgery in a public hospital of Curitiba city, showed the most frequent signs and symptoms were: nodule or lump in the neck (78.13%), troubles to swallow (56.25%), voice disturbances (40.63%), and breathlessness (34.38%). Furthermore, the subjects reported the disease cause limitations in work and daily activities. This study highlights the importance to investigate the voice related features of patients with thyroid disease before surgery⁴.

In the current study, the EG subjects had worst scores of voice-related quality of life to all domains,

physical, socio-emotional, and total (Table 2). Beyond statistically different, it was observed the all the scores domains in EG are lower than recommend by literature to health voices, and all CG scores domains are higher than expected, which is higher than 91.25¹⁸.

The scores to physical, socio-emotional, and total domains in the present study were 74.44, 83.54, and 78.75, respectively. The index are similar to a study analyzing the voice-related quality of life of 67 women with benign thyroid disease diagnose, and mean age of 44.7 ± 14.8 years, as follow: 76.25, 77.72, and 73.09 to the physical, socio-emotional domain, and total, respectively. The study also concluded the patients with benign thyroid disease have high frequency of voice complaints and their voices have negative impact on quality of life⁵. Yet in studies analyzing patients with suspicion of thyroid cancer the index found were slight higher of 84.21, 92.86, and 85.00 to physical, socio-emotional, and total domain respectively²³.

Furthermore, it is observed these indexes are similar to the ones found in studies analyzing other dysphonic population^{26,27}. Other research comparing dysphonic and health subjects of primary health service had mean of total domain of 93.6 in health subjects and 83 in dysphonic patients, also finding significant difference between groups²⁸, corroborating the results of the current study regarding the comparison between EG and CG.

The difference between the studied groups may be attributed to the choice of a control group with a disease that do not compromise or cause symptoms related to the phonation system or voice,^{14,15} and, therefore, do not impair the voice-related quality of life due to the disease.

Analyzing exclusively the EG it was observed the physical domain was the most affected (Table 3). This result corroborates the conclusion of studies with thyroid benign disease patients⁵, and suspicion of thyroid cancer²³. Probably the results are original from the physical discomfort related to the symptoms and the voice features of this population¹⁰⁻¹², which are perceptible regardless the subjects' voice demand and profession, and lately the subject perceives the interference in social and daily activities, and the amount these limitations impact emotionally. But the voice deviation do not impact the social and emotional components (socio-emotional domains), because they do not incapacitate the development of daily activities.

A positive strong correlation was found between the physical and socio-emotional domains scores in

EG subjects (Figure 1). The results show despite the physical domain to be more affected, while physical is impaired, the limitation also influence emotionally the subject.

The study analyzing dysphonia patients in general pointed out the most influence in subject's quality of life is physical symptoms, but the dysphonic subjects have the perception about their voices no to be sounding as should be, whether due to troubles in production, whether to troubles in voice daily use, which also impacts the other domains²⁶.

Other studies about thyroid diseases whether in treatment definition stage or assessing before and after treatment¹⁹ also highlight the negative voice self-assessment of this population. In addition, the literature^{1,19,21,29} point out the importance of speech language pathologist in the multi-professional team following this population, starting before the surgery, helping in the voice symptoms control and decreasing the effects of voice complaint in quality of life using guidance, long term following, and, in cases which already have the indication, therapy pre and post surgery.

CONCLUSION

It is concluded, from the obtained results, the studied women group with thyroid disease pre thyroidectomy has negative impact in voice-related quality of life, mainly in physical domain, and as the physical symptoms regarding voice begin, there is socio-emotional impairment.

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