OLFACTORY ACUITY AND QUALITY OF LIFE AFTER TOTAL LARYNGECTOMY

Acuidade olfatória e qualidade de vida após a laringectomia total

Christiane Gouvêa dos Santos⁽¹⁾, Anke Bergmann⁽²⁾, Kaliani Lima Coça⁽²⁾,
Angela Albuquerque Garcia⁽³⁾, Tânia Cristina de Oliveira Valente⁽⁴⁾

ABSTRACT

Purpose: to identify the prevalence and factors associated to olfaction disorders and describe the quality of life after total laryngectomy. **Methods:** cross-sectional study to evaluate the olfactory acuity and quality of life of total laryngectomized patients in the Instituto Nacional de Cancer through the application of The University of Pennsylvania Smell Identification Test, The University of Washington Quality of Life Questionnaire and the Olfactory Acuity Pre-Rehabilitation of Smell Questionnaire. **Results:** 48 total laryngectomized were evaluated, 39 males and 9 females, mean age of 62 years and mean time of 5,6 years after total laryngectomy. In the smell identification test the mean score was 17,9. According to the classification of smell in the test, most participants had some degree of olfaction disorders, only 2 subjects had their smell considered normal. In the The University of Washington Quality of Life Questionnaire, the composite score was 80.47. The domains that had the lowest scores were taste, saliva and speech. In the Olfactory Acuity Pre-Rehabilitation of Smell Questionnaire, most participants considered their smell bad to reasonable. 21 individuals reported having some degree of difficulty in daily life activities related to olfaction disorders. **Conclusion:** the total laryngectomized patients showed high prevalence of olfaction disorders, with impairments in their daily life activities.

KEYWORDS: Laryngectomy; Quality of Life; Smell; Olfaction Disorders

■ INTRODUCTION

Total laryngectomy is a surgical treatment in which there is the total removal of the laryngeal framework, resulting in anatomical-functional, psychological and social changes. It affects not only breathing, speech, swallowing, olfaction and taste functions, but also the quality of life of the patients who underwent this surgery¹⁻⁴.

The interruption of the nasal airflow due to total laryngectomy hinders the odor molecules of reaching the olfactory epithelium and stops its stimulation, resulting in olfaction disorders⁵⁻⁷. Therefore, the total laryngectomized patient has a decrease in the olfactory perception (hiposmia) or even a total absence of olfaction (anosmia)^{8,9}.

The olfactory sense is extremely important, once it enables the perception of delightful scents such as perfumes and food, and it helps in potentially dangerous situations, in detecting spoilt food, gas leak and smoke, or even in the perception of the own body odor^{7,10,11}.

Studies have verified the rehabilitation of olfaction improves the total laryngectomized patients' quality of life^{6,7,12-14}.

The concept of quality of life is subjective and personal; it is based on individual experiences and it changes constantly according to each one's experiences.

(1) Universidade Federal do Estado do Rio de Janeiro, UNIRIO, Rio de Janeiro, RJ, Brasil.

(2) Instituto Nacional de Câncer José Alencar Gomes da Silva, Rio de Janeiro, RJ, Brasil.

(3) Departamento de Fonoaudiologia da Faculdade de Medicina da Universidade Federal do Rio de Janeiro - UFRJ, Rio de Janeiro, RJ, Brasil.

(4) Departamento de Saúde Coletiva da Universidade Federal do Estado do Rio de Janeiro - UNIRIO, Rio de Janeiro, RJ, Brasil.

Conflict of interest: non-existent

We chose the definition of the World Health Organization (WHO): "The individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"¹⁵. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships and their relationships to environmental features.

Nowadays, the speech therapy on total laryngectomized patients focuses mainly in the rehabilitation of the communication; the olfaction is little assessed and rehabilitated.

This study aimed to identify the prevalence of olfaction disorders and the factors associated to them and describe the quality of life post-total laryngectomy.

■ METHODS

We conducted a cross-sectional study to evaluate the olfactory acuity, the factors associated with the olfaction disorders and the quality of life in total laryngectomized patients at the Cancer Hospital I, National Cancer Institute Jose Alencar Gomes da Silva- INCA. This study was approved by the Committee of Ethics in Research of the Institution, under the number 880.367.

The patients were selected among those who were submitted to treatment at the speech-therapy clinic; 48 total laryngectomized patients were evaluated from December 2014 to April 2015.

The sample included total laryngectomized patients of both genders, with a minimum period after treatment of six months (surgery/radiotherapy/chemotherapy), who had an effective communication and were being monitored at the Head and Neck Service and at the INCA Speech-Therapy department.

We excluded patients under 18 years old, with nasointestinal or gastrostomy feeding tube, with any clinical or surgical complication, with a disease in progress, any olfaction disorders previous to laryngectomy, known respiratory allergy and those that did not sign the consent form (CF).

The instruments applied to assess the participants' olfaction and their quality of life are described below.

Smell Identification Test

To assess the olfactory function, we used the University of Pennsylvania Smell Identification Test™ (UPSIT- Sensonics, Incorporation, Haddon Hts., NJ 08035). The UPSIT consists of four booklets of 10 odors, with one odor per page, totalizing 40 odors. The stimuli are soaked in plastic

microcapsules present in a brown stripe at the bottom of each page. The examiner guides the patient to scratch with a pencil the brown stripe to release the odor. Next, the patient needs to choose the option that better describes the odor. At the end of this questionnaire, there is a score from 0 (worst) to 40 (best) that is expressed by a classification of the olfactory function as normosmia, microsmia (mild, moderate and severe) and anosmia¹⁶.

The test was translated into Portuguese by a Brazilian neurologist and a Brazilian otorhinolaryngologist under the supervision of the test creator¹⁷. This evaluation was applied in the Brazilian population in recent studies¹⁸⁻²⁰. The Portuguese adaptation of the UPSIT was validated by Fornazieri et al.²¹.

Quality of life Questionnaire

To evaluate the quality of life, we applied the Brazilian version of the University of Washington Quality of Life questionnaire (UW-QOL), which was adapted and validated by Vartanian et al.²², for patients with head and neck cancer.

The questionnaire consists of 12 questions that enclose the domains pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste, saliva, mood and anxiety. Each question has between 3 and 6 answer options with scores from 0 (worst) to 100 (best). Moreover, it presents a composite score that is the average of the 12 domains. It also presents a question that allows patients to classify which of the domains have been the most important for them, 3 global questions on the patients' self-evaluation of their quality of life and one opened question for any other considerations the participant wishes to do.

Questionnaire about the olfactory acuity pre-rehabilitation of olfaction

We designed the questionnaire used to evaluate the perception each subject has of their olfaction based on questionnaires already described in literature^{9,13}.

It is composed of 7 questions with 4 answer options for each. The first two questions are related to how the subject considers their olfaction and taste, respectively; the questions from 3 to 6 assess how often the participant smells perfumes, foods, gas leaking and smoke; question 7 verifies if there is presence of any difficulty in the subject's daily life due to alteration in the perception of smells. This questionnaire aims to verify the impact of the olfaction disorder on the total laryngectomized patients' quality of life, associated with the standard protocol of quality of life described afterwards.

Data were organized in an Excel® sheet. For the descriptive analysis, mean and standard deviation were presented as numbers (%). For the assessment of the factors associated with the anosmia (outcome), a univariate logistic regression was carried out by means of odds ratio. The value of $p < 0.05$ was considered statistically significant. We carried out the statistical analyses through the program SPSS, version 20.0.

■ RESULTS

We assessed 48 total laryngectomized patients, 39 male and 9 female, with a mean age of 62 years old and a mean period of 5-6 years since total laryngectomy. From the subjects evaluated, 32 (66.7%) presented level of education up to elementary school; 45 (93.8%) had a previous nicotine addiction history; 41 (85.4%) had an alcoholism history, 9 of them (18.8%) still drink alcohol.

Regarding the communication mean used by participants: 25 (52.1%) used tracheoesophageal prosthesis, 20 (41.7%) used the electrolarynx and only 3 (6.3%) used the esophageal speech. The demographic, clinical and treatment characteristics are described in Table 1.

In the smell identification test (UPSIT), the mean score was 17.9. According to the olfaction classification in the test: 24 (50.0%) laryngectomized patients presented anosmia, 22 (45.8%) presented a type of microsmia and only 2 (4.2%) had the olfaction considered within the normality. The olfaction classification is described in Table 2.

The scores from the UW-QOL indicate good quality of life. The mean of the composite score was 80.47. The domains presenting the highest score averages were chewing, anxiety and mood, 92.71,

89.06 and 88.54, respectively. On the other hand, the domains with the lowest score averages were taste, saliva and speech, 63.17, 71.6 and 73.02, respectively. The distribution of scores related to each domain is described in Table 3.

For the subjective domains of the UW-QOL questionnaire: 33 (68.75%) total laryngectomized patients classified their quality of life as better or equal to the period previous to the cancer; 35 (72.9%) subjects considered their health-related quality of life between good, very good or outstanding in the last seven days. For the overall quality of life, 38 (79.1%) patients classified it from good to outstanding. The frequency of the subjective domains is in Table 4.

At the end of the questionnaire, the participant can describe, in free text, any other problem that important for their quality of life and that were not mentioned in the previous questions. In this item, the most important problem mentioned was the olfaction, referred by 19 (39.5%) participants.

In the olfactory acuity pre-rehabilitation of olfaction questionnaire, 16(33.3%) participants considered their olfaction poor, 20(41.7%) fair and only 12(25.0%) considered it good. None of the participants considered their olfaction as very good. This questionnaire also assessed the patient's taste-related perception: 28(58.3%) patients classified taste from good to very good and 20(41.6%) considered it from poor to fair. Regarding the difficulties on daily life due to the olfaction disorder, 21 (43.7%) subjects reported some level of difficulty. The description of the questionnaire about olfactory acuity is in Table 5.

There were no identified factors associated with anosmia in the population studied. The assessment of the factors associated with anosmia is described in Table 6.

Table 1 – Demographic, clinical and treatment characteristics (n=48)

Variable	n (%)
Work	
Retired, on leave, housewife	33 (68.8)
External job	15 (31.3)
Ethnic group	
White	15 (31.3)
Black	8 (16.7)
Brown	25 (52.1)
Marital status	
Single	9 (18.8)
Married	25 (52.1)
Widowed	5 (10.4)
Divorced	4 (8.3)
Separated	5 (10.4)
Educational level	
Illiterate	1 (2.1)
Elementary school incomplete	26 (54.2)
Elementary school complete	5 (10.4)
High school incomplete	4 (8.3)
High school complete	6 (12.5)
Higher education incomplete	2 (4.2)
Higher education complete	4 (8.3)
Nicotine addiction	
Never smoked	3 (6.3)
Quit smoking	45 (93.8)
Nicotine age – 15 years	
Smoked ≤ 15 years	27 (56.3)
Smoked > 15 years	18 (37.5)
Alcoholism	
Never drank	7 (14.6)
Quit drinking	32 (66.7)
Still drink	9 (18.8)
Alcoholism age- 15 years	
Drank ≤ 15 years	15 (31.3)
Drank > 15 years	25 (52.1)
Medication	
No	4 (8.3)
Yes	44 (91.7)
Known Allergies	
No	45 (93.8)
Yes	3 (6.3)
T- Primary Tumor	
2	3 (6.3)
3	8 (16.7)
4	37 (77.1)
N- REGIONAL LYMPH NODE METASTASIS	
0	31 (64.6)
1	7 (14.6)
2	9 (18.8)
3	1 (2.1)
Cervical Leaking	
No	4 (8.3)
Yes	44 (91.7)
Radiotherapy	
No	3 (6.3)
Neoadjuvant	4 (8.3)
Adjuvant	41 (85.4)
Chemotherapy	
No	44 (91.7)
Neoadjuvant	3 (6.3)
Adjuvant	1 (2.1)

Table 2 – Mean score, standard deviation and the olfaction classification of the University of Pennsylvania Smell Identification Test of total laryngectomized patients (UPSIT) (n=48)

Variables	n (%)
Score mean (standard deviation)	17.9 (11.4)
Olfaction classification	
Anosmia	24 (50.0)
Severe microsmia	7 (14.6)
Moderate Microsmia	8 (16.7)
Mild microsmia	7 (14.6)
Normosmia	2 (4.2)

Table 3 – Score of the 12 domains. Mean and median of the University of Washington Quality of Life Questionnaire (UW-QOL)

QOL domain	Mean (sd)	Median (min-max)
Composite score	80.47 (12.03)	79.87 (47.16 - 100.00)
Pain	78.13 (22.84)	75.00 (25.00 -100.00)
Appearance	86.46 (20.60)	100.00 (50.00 - 100.00)
Activity	87.50 (16.30)	100.00 (25.00 – 100.00)
Recreation	82.81 (21.36)	100.00 (25.00 –100.00)
Swallowing	78.67 (17.39)	67.00 (33.00 – 100.00)
Chewing	92.71 (17.83)	100.00 (50.00 – 100.00)
Speech	73.02 (30.49)	67.00 (0.00 - 100.00)
Shoulder	74.42 (30.15)	67.00 (0.00 – 100.00)
Taste	63.17 (33.95)	67.00 (0.00 – 100.00)
Saliva	71.6 (28.39)	67.00 (0.00 – 100.00)
Mood	88.54 (24.71)	100.00 (25.00 – 100.00)
Anxiety	89.06 (19.91)	100.00 (0.00 – 100.00)

QOL- Quality of life; sd- standard deviation; min- minimum; max- maximum

Table 4 – Frequency of the subjective domains of the UW-QOL of total laryngectomized patients (n=48)

Question	Domains	n (%)
Compared to the month before you developed cancer. How would you rate your health-related quality of life?	Much better	15 (31.3)
	Somewhat better	3 (6.3)
	About the same	15 (31.3)
	Somewhat worse	12 (25.0)
	Much worse	3 (6.3)
In general, would you say your health-related quality of life during the past 7 days has been:	Outstanding	9 (18.8)
	Very good	6 (12.5)
	Good	20 (41.7)
	Fair	11 (22.9)
	Poor	2 (4.2)
Overall, quality of life includes not only physical and mental health, but also many other factors such as family, friends, spirituality or personal leisure activities that are important to your enjoyment of life. Considering everything in your life that contributes to your personal well-being, rate your overall quality of life during the past 7 days:	Very poor	0 (0.0)
	Outstanding	15 (31.3)
	Very good	8 (16.7)
	Good	15 (31.3)
	Fair	9 (18.8)
	Poor	1 (2.1)
	Very poor	0 (0.0)

Table 5 – Result of the questionnaire about olfactory acuity pre-rehabilitation of olfaction (n=48)

Question	n (%)
How do you consider your olfaction at this moment?	
Poor	16 (33.3)
Fair	20 (41.7)
Good	12 (25.0)
Very good	0 (0.0)
How do you consider your taste at this moment?	
Poor	3 (6.3)
Fair	17 (35.4)
Good	24 (50.0)
Very good	4 (8.3)
How often can you smell perfume?	
I never feel	9 (18.8)
I feel sometimes	16 (33.3)
I usually feel	8 (16.7)
I always feel	15 (31.3)
How often can you smell food?	
I never feel	8 (16.7)
I sometimes feel	24 (50.0)
I usually feel	10 (20.8)
I always feel	6 (12.5)
How often can you smell gas-leaking odor?	
I never feel	23 (47.9)
I sometimes feel	12 (25.0)
I usually feel	2 (4.2)
I always feel	11(22.9)
How often can you smell smoke?	
I never feel	15 (31.3)
I sometimes feel	12 (25.0)
I usually feel	8 (16.7)
I always feel	13 (27.1)
Do you have any difficultness in your daily life due to alteration in the perception of the odors?	
I do not have any difficulty	27 (56.3)
I have few difficulties	8 (16.7)
I have some difficulties	6 (12.5)
I have many difficulties	7 (14.6)

Table 6 – Factors associated with anosmia (n=48)

Variables	Anosmia			
	Yes n (%)	No n (%)	OR (CI 95%)	P value
Age				
< 65 years old	13 (27.1%)	17 (35.4%)	0.487 (0.148 - 1.602)	0.233
> 65 years old	11 (22.9%)	07 (14.6%)	Reference	
Gender				
Male	19 (39.6%)	20(41.7%)	0.760(0.177-3.263)	0.712
Female	5(10.4%)	4(8.3%)	Reference	
Currently works				
No	19(39.6%)	15(31.2%)	2.280(0.630-8.248)	0.204
Yes	5(10.4%)	9(18.8%)	Reference	
Time after surgery				
< 5 years	16(33.3%)	13(27.1%)	1.692(0.526-5.444)	0.376
> 5 years	8(16.7%)	11(22.9%)	Reference	
Color of the skin				
White	6(12.5%)	9(18.8%)	0.556(0.161-1.919)	0.350
Brown and Black	18(37.5%)	15(31.2%)	Reference	
Partner				
With partner	13(27.1%)	12(25.0%)	1.182(0.380-3.672)	0.773
Without partner	11(22.9%)	12(25.0%)	References	
Educational level				
Up to 8 years of study (high school incomplete)	16(33.3%)	11(22.9%)	2.364(0.735-7.603)	0.146
>= 8 years (high school complete and higher)	8(16.7%)	13(27.1%)	References	
Cervical Leaking				
No	1(2.1%)	3(6.2%)	0.304(0.029-3.157)	0.296
Yes	23(47.9%)	21(43.8%)	Reference	
primary tumor size				
T4	17(35.4%)	20(41.7%)	0.486(0.121-1.947)	0.303
T2 and T3	7(14.6%)	4(8.3%)	Reference	
Lymphoma status				
Positive	10(20.8%)	7(14.6%)	1.735(0.524-5.743)	0.365
Negative (N0)	14(29.2%)	17(35.4%)	Reference	

OR= Odds Ratio; CI = Confidence Interval; p value <0.05. We used the test Univariate Logistic Regression.

■ DISCUSSION

We analyzed 48 total laryngectomized patients diagnosed and treated in one reference centre for oncology treatment. The diagnosis identified that most patients (95.8%) presented some olfaction disorder, with a good quality of life (80.47), some reported poor (33.3%) and fair (41.7%) olfaction. We did not identify factors associated with anosmia in the population studied.

Most patients in this study are men, with a mean age above 60 years old, which is compatible to the world prevalence of larynx cancer^{9,23-25}.

The high percentage of olfaction disorder found in total laryngectomized patients in this study 46(95.8%) corroborates with previous studies²⁶⁻²⁹.

The possible causes for olfactory acuity disorders were described in literature. The majority of studies referrers as the main cause for olfaction disorder in this population the total separation of the upper and lower airways causing the transference of the nasal air flow to a permanent tracheostomy tube, which makes it difficult for the air to get to the nasal cavity, where the olfactory epithelium⁵⁻⁷.

There are some studies describing the olfactory epithelium degenerations, which associated with

the loss of nasal air flow contributes to olfaction disorders in total laryngectomized patients^{9,30}.

A more recent study indicated a significant reduction in the volume of the olfactory bulb of total laryngectomized patients compared to the pre-surgery size, suggesting that the total removal of the larynx interrupts the nasal airflow and the olfactory input for the olfactory bulb, causing the reduction of the olfactory acuity and its volume⁸.

There was no statistically significant association between the olfaction disorders and the variables age, gender, education, color of the skin. This result is possibly due to the reduced number of participants and to the homogeneity of the sample, as all patients are total laryngectomized, mostly men, with age very close, presenting nicotine addiction and alcoholism history, similar tumor and oncology treatment characteristics.

In the treatment of advanced tumors of the larynx, the great challenge and goal is to ensure the patients' survival free from disease and minimize the functional impacts, providing a better quality of life^{23,31,32}.

The assessment of the quality of life after head and neck cancer has been an extremely important tool to evaluate the disease and the treatment impacts on the patient's functionality, helping to guide their therapeutic choices^{32,33}.

Although the total laryngectomized patients' quality of life tends to be worst in relation to the population in general^{24,34}, some studies, in accordance to this research, do not show low scores on the quality of life assessment, compared to the population of not laryngectomized subjects.

Some factors can explain these results. All study participants were already rehabilitated with an effective communication method (inclusion criteria), had a mean time of 5-6 years between surgery and this study, which can have provided a period for adaptations and compensations related to consequences, helping the patient to deal better with them. Furthermore, changes related to unhealthy habits that previously interfered in their social and family relations such as nicotine addiction and alcoholism and the improvement of care after total laryngectomy can be associated with a satisfactory quality of life in this group of patients.

Most participants were submitted to radiotherapy (93.75%), a treatment that has an impact on the saliva production and taste perception. Such alterations contribute to a worsening in this population quality of life^{32,35}. In this study, the most altered domains in the UW-QOL were taste, saliva and speech, respectively.

Since this is a population with several specificities, the assessment of the quality of life in total

laryngectomized patients' needs questionnaires that are more specific with questions addressing their problems, difficulties and needs. These questionnaires can be applied combined to pre-existent validated questionnaires.

Op de coul et al.³³ developed a study to evaluate whether the existent standard questionnaires give sufficiently detailed information about the total laryngectomized patients' quality of life or if questionnaires that are more specific are necessary. The results showed that in the standard tests, quality of life in this population presented a good level. However, the additional questionnaire applied demonstrated that more detailed information was obtained specifically regarding voice and breathing. Therefore, is necessary to develop complementary questionnaires that are more specific to assess these subjects' symptoms.

Considering this discussion, we designed a questionnaire (the olfactory acuity pre-rehabilitation of olfaction questionnaire) based on international studies with specific questions about the total laryngectomized patients' olfaction and the disorder impact in their daily lives. This questionnaire was applied as a tool to complement the quality of life assessment of these subjects, since the UW-QOL does not hold questions specifically related to olfaction.

The results of the olfactory acuity pre-rehabilitation of olfaction questionnaire demonstrated the total laryngectomized patients' difficulties in noticing perfumes, food, gas leak and smoke; they also pointed out difficulties in their daily lives related to olfaction disorders, suggesting that such alterations cause impairs in their quality of life.

Although several international studies have described aspects of the assessment and rehabilitation of olfaction in total laryngectomized patients, for decades^{9,29,36}, few Brazilian studies have been giving attention to this theme^{27,37}. It is necessary to assess and rehabilitate such function, since its alteration causes negative impacts on quality of life, nourishment and even on the patients' safety.

Due to the connection between olfaction and taste, total laryngectomized patients can present ageusia or hypogeusia. Previous researches^{13,26,27} reinforce the hypothesis of these sensorial alterations in total laryngectomized patients. In this study, 41.6% of the patients reported some problem related to taste in the questionnaire about olfactory acuity, considering their taste fair or poor.

The international literature has described the impacts of the olfaction and taste disorders on the low acceptance of food, in the diminishment of social interactions during meals, in the reduction of appetite and pleasure in eating^{38,39}. A study developed with

the elderly population also points out the indifference to food and low ingestion due to olfaction and taste disorders found in this population⁴⁰.

Similar results are also found in total laryngectomized patients. Some authors demonstrate the close relation between the olfaction and taste functions on the perception of food tastes and that these function alterations would result in nutritional losses, on the appetite and even influence on weight loss^{10,11,14}.

Although the olfaction sense is often strictly related to pleasure odors such as perfumes and food, it is also a sense of extreme importance for surviving in alert situations such as fires, short circuits, burning food, gas leak and spoiled food. Some studies report these difficulties in total laryngectomized patients population^{11,27,29,33}.

This study verifies this difficulty in the perception of smell related to dangerous situations, such as gas leak and smoke. Many total laryngectomized patients feel insecure in developing daily life activities alone because of the fear to forget a pan on the stove and do not realize that it is burning, or a gas leak at home or even a possible fire. This fear

contributes for a dependency sensation that can affect these subjects' quality of life.

This study did not focus on taste; however, we understand the need of studies developed in this field, considering the great number of patients reporting complaints related to this function and the importance of taste in the nourishment process and in the subjects' quality of life.

The sample size limitation did not enable the identification of factors associated with anosmia.

■ CONCLUSION

The olfactory disorders are present in a great number of total laryngectomized patients. Although they report a good quality of life, the olfactory disorders interfere in the development of some daily life activities. Therefore, the rehabilitation of olfaction should be included in the speech-therapy intervention carried out with these patients, associated with the communication rehabilitation.

RESUMO

Objetivo: identificar a prevalência e os fatores associados às alterações do olfato e descrever a qualidade de vida após a laringectomia total. **Métodos:** estudo transversal para avaliar a acuidade olfatória e a qualidade de vida de laringectomizados totais no Instituto Nacional de Câncer por meio da aplicação do Teste de Identificação do Olfato da Universidade da Pensilvânia, do Questionário de Qualidade de Vida da Universidade de Washington e do Questionário sobre a Acuidade Olfatória Pré-Reabilitação do Olfato. **Resultados:** foram avaliados 48 laringectomizados totais, sendo 39 do sexo masculino e 9 do sexo feminino, com idade média de 62 anos e tempo médio de 5,6 anos desde a laringectomia total. No Teste de Identificação do Olfato a pontuação média foi de 17,9. De acordo com a classificação do olfato no teste, a maioria dos participantes apresentou algum grau de alteração, sendo que apenas 2 indivíduos tiveram o olfato considerado dentro da normalidade. No Questionário de Qualidade de vida da Universidade de Washington, o escore composto foi 80,47. Os domínios que apresentaram as médias de pontos mais baixas foram paladar, saliva e fala. No questionário sobre a acuidade olfatória pré-reabilitação do olfato, a maioria dos participantes consideraram seu olfato de ruim a razoável. 21 indivíduos relataram apresentar algum grau de dificuldade em suas atividades de vida diária em decorrência de alterações do olfato. **Conclusão:** os laringectomizados totais apresentaram alta prevalência de alterações do olfato, com comprometimentos relacionados às suas atividades de vida diária.

DESCRIPTORIOS: Laringectomia; Qualidade de Vida; Olfato, Transtornos do Olfato

■ REFERENCES

1. Vicente LCC, Oliveira PM, Salles PV. Laringectomia Total- Avaliação e Reabilitação. In: Carvalho V, Barbosa EA. Fononcologia. Rio de Janeiro: Editora Revinter, 2012. p. 285-306.
2. Barros APB, Portas JG, Queija DS, Lehn CN, Dedivitis RA. Autopercepção da desvantagem vocal (VHI) e qualidade de vida relacionada à deglutição (SWAL-QOL) de pacientes laringectomizados totais. *Rev Bras Cir Cabeça Pescoço*. 2007;36(1):32-7.
3. Carmo RD, Camargo Z, Nemr K. Relação entre Qualidade de Vida e Auto-Percepção da Qualidade Vocal de pacientes Laringectomizados Totais: Estudo Piloto. *Rev CEFAC*. 2006;8(4):518-28.
4. Carrara-de Angelis E, Furia CLB, Mourão LF. Reabilitação Fonoaudiológica das Laringectomias Totais. In: Carrara-de Angelis E, Furia CLB, Mourão LF, Kowalski LP. A Atuação da Fonoaudiologia no Câncer de Cabeça e Pescoço. São Paulo: Lovise, 2000. p.227- 38.
5. Manestar D, Ticac R, Maricic S, Malvic G, Corak D, Marjanovic Kavanagh M, Prgommet D, Starcevic R. Amount of airflow required for olfactory perception in laryngectomees: a prospective interventional study. *Clin Otolaryngol*. 2012;37:28-34.
6. Moor JW, Rafferty A, Sood S. Can laryngectomees smell? Considerations regarding olfactory rehabilitation following total laryngectomy. *The Journal of Laryngology & Otology*. 2010;124:361-5.
7. Ward E, Coleman A, Van As CJ, Kerle S. Rehabilitation of olfaction post- laryngectomy: a randomized control trial comparing clinician assisted versus a home practice approach. *Clin Otolaryngol*. 2010;35(1):39-45.
8. Veyseller B, Ozucer B, Akdoy F, Yildirim YS, Gurbuz D, Balıkcı HH et al. Reduced olfactory bulb volume and diminished olfactory function in total laryngectomy patients: A prospective longitudinal study. *Am J Rhinol Allergy*. 2012;26:191-3.
9. Fujii M, Fukazawa K, Hatta C, Yasuno H, Sakagami M. Olfactory Acuity after Total Laryngectomy. *Chem Senses*. 2002;27(2):117-21.
10. Van As- Brooks CJ, Finizia CA, Kerle SM, Ward EC. Rehabilitation of olfaction and taste following total laryngectomy. In: Ward EC, Van As- Brooks CJ. Head and neck cancer: treatment, rehabilitation, and outcomes. San Diego: Plural Publishing, 2014. p. 421-45.
11. Leon EA, Catalanotto FA, Werning JW. Retronasal and Orthonasal Olfactory Ability after Laryngectomy. *Arch Otolaryngol Head Neck Surg*. 2007;133:32-6.
12. Risberg-Berlin B, Karlsson TR, Tuomi L, Finizia C. Effectiveness of olfactory rehabilitation according to a structured protocol with potential of regaining pre-operative levels in laryngectomy patients using nasal airflow-inducing maneuver. *Eur Arch Otorhinolaryngol*. 2014;241:1113-9.
13. Morales-Puebla JM, Morales- Puebla AF, Jiménez- Antolin JA, Muñoz –Platón E, Padilla-Parrado M, Chacón- Martínez J. Olfactory rehabilitation after total laryngectomy. *Acta Otorrinolaringol Esp*. 2010;61(2):128-34.
14. Risberg-Berlin B, Rydén A, Moller RY, Finizia C. Effects of total laryngectomy on olfactory function, health-related quality of life, and communication: a 3- year follow- up study. *BMC Ear, Nose and Throat Disorders*. [periodico na internet] 2009 [acesso em 2013 jul.]; 9 (8): [9p.]. Disponível em www.biomedcentral.com/1472-6815/9/8.
15. The World Health Organization Quality of Life Assessment (WHOQOL): Position paper from the World Health Organization. *Soc Sci Med*.1995;41(10):1403-9.
16. Doty RL, Shaman P, Kimmelman CP, Dann MS. University of Pennsylvania Smell Identification Test: A rapid quantitative olfactory function test for the clinic. *Laryngoscope*. 1984;94:176-8.
17. Doty RL. The Smell Identification TestTM Administration Manual, Sensonics, Inc., Philadelphia, USA.1995.
18. Fornazieri MA, Doty RL, Santos CA, Bezerra TF, Pinna FR, Voegels RL. A new cultural adaptation of the University of Pennsylvania Smell Identification Test. *Clinics*. 2013;68(1):65-8.
19. Fornazieri MA, Pinna FR, Bezerra TFP, Antunes MB, Voegels RL. Applicability of the University of Pennsylvania smell identification test (SIT) in Brazilians: pilot study. *Braz J Otorhinolaryngol*. 2010;76(6): 695- 9.
20. Silveira-Moriyama L, Azevedo AMS, Ranvaud R, Barbosa ER, Doty RL, Lees AJ. Applying a new version of the Brazilian- Portuguese UPSIT smell test in Brazil. *Arq Neuropsiquiatr*. 2010;68(5):700-5.
21. Fornazieri MA, Santos CA, Bezerra, TFP, Pinna FR, Voegels RL, Doty RL. Development of Normative Data for the Brazilian Adaptation of theUniversity of Pennsylvania Smell Identification Test. *Chem Senses*. 2015;40:141-9.
22. Vartanian JG, Carvalho AL,Yueh B, Furia CLB, Toyota J, McDowell JA. Brazilian-Portuguese validation of the University of Washington Quality of Life Questionnaire for patients with head and neck cancer. *Head and Neck*. 2006;28(12):1115-21.
23. Estimativa 2014: Incidência de Câncer no Brasil / Instituto Nacional de Câncer José Alencar Gomes da Silva, Coordenação de Prevenção e Vigilância. Rio de Janeiro: INCA, 2014. 124p. Disponível em:< <http://www.inca.gov.br>> acesso em 12 de Ago. 2014.

24. Silva A P, Feliciano T, Freitas SV, Esteves S, Sousa CA. Quality of life in patients submitted to total laryngectomy. *J Voice*. 2015;29(3):382-8.
25. Wünsch V. The epidemiology of laryngeal cancer in Brazil. *São Paulo Med J*. 2004;122(5):188-94.
26. Mumovic G, Hocevar-Boltezar I. Olfaction and gustation abilities after a total laryngectomy. *Radiol Oncol*. 2014;48(3):301-6.
27. Caldas ASC, Facundes VLD, Cunha DA, Balata PMM, Leal LB, Silva HJJ. Gustatory and olfactory dysfunction in laryngectomized patients. *Braz J Otorhinolaryngol*. 2013;79(5):546-54.
28. Haxel BR, Fuchs C, Fruth K, Mann WJ, Lippert BM. Evaluation of the “nasal airflow- inducing maneuver” for smell rehabilitation in laryngectomees by means of the sniffin’Sticks test. *Clin Otolaryngol Mainz*. 2011;36:17-23.
29. Vam-Dam FSAM, Hilgers FJM, Embroek G, Touw FL, Van As CJ, De Jong N. Deterioration of olfaction and gestation as a consequence of total laryngectomy. *Laryngoscope*. 1999;109:1150-5.
30. Miani C, Ortolani F, Bracale AMB, Petrelli L, Staffieri A, Marchini M. Olfactory mucosa histological findings in laryngectomees. *Eur Arch Otorhinolaryngol*. 2003;260:529-35.
31. Lee TL, Wang LW, Chang PMH, Chu PY. Quality of life for patients with hypopharyngeal cancer after different therapeutic modalities. *Head & Neck*. 2013;35(2):280- 5.
32. Paula FC, Gama RR. Avaliação de qualidade de vida em laringectomizados totais. *Rev Bras Cir Cabeça Pescoço*. 2009;38(3):177-82.
33. Op de Coul BMR, Ackerstaff AH, Van As CJ, Van den Hoogen FJA, Meeuwis CA, Manni JJ et al. Quality of life assessment in laryngectomized individuals: do we need addition to standard questionnaires in specific clinical research projects? *Clin. Otolaryngol*. 2005;30:169-75.
34. Miwa T, Furukawa M, Tsukatani T, Constanzo RM, Dinardo LJ, Reiter ER. Impact of olfactory impairment on quality of life and disability. *Arch Otolaryngol Head Neck Surg*. 2001;127:497-503.
35. Tribius S, Sommer J, Prosch C, Bajrovic A, Muenscher A, Blessmann M et al. Xerostomia after radiotherapy. What matters—mean total dose or dose to each parotid gland? *Strahlenther Onkol*. 2013;189(3):216-22.
36. Hilgers FJM, Van Dam FSAM, Keyzers S, Koster MN, Van As CJ, Muller MJ. Rehabilitation of Olfaction After Laryngectomy by means of a Nasal Airflow- Inducing Maneuver – the “polite yawning” technique. *Arch Otolaryngol Head Neck Surg*. 2000;126:726-32.
37. Cleto M L, Pedalini LM, Júnior JFM. Reativação do Olfato em Laringectomizados Totais. *Arq Int Otorrinolaringol*. 2005;9(2):102-7.
38. Aschenbrenner K, Hummel C, Teszmer K, Krone F, Ishimaru T, Seo HS, Hummel T. The influence of olfactory loss on dietary behaviors. *Laryngoscope*. 2008;118:135- 44.
39. Mattes RD, Cowart BJ, Schiavo MA, Arnold C, Garrison B, Kare MR, Lowry LD. Dietary evaluation of patients with smell and/or taste disorders. *Am J Clin Nutr*. 1990;51:233-40.
40. Asai JL. Nutrition and the geriatric rehabilitation patient: challenges and solutions. *Top Geriatr Rehabil*. 2004;20:34-45.

<http://dx.doi.org/10.1590/1982-0216201517611415>

Received on: July 22, 2015

Accepted on: August 20, 2015

Mailing address:

Christiane Gouvêa dos Santos

Avenida Maracanã, 1001, bloco 01 apto 806, Tijuca

Rio de Janeiro – RJ – Brasil

CEP: 20511-000

E-mail: chrisgou@ig.com.br