

Original articles

# Laryngeal cancer patients in the northeast of Brazil: surgical intervention and speech rehabilitation

*Pacientes com câncer de laringe no nordeste: intervenção cirúrgica e reabilitação fonoaudiológica*

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Conflict of interest: non-existent

Received on: April 14, 2015  
Accepted on: October 26, 2015

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## ABSTRACT

**Purpose:** to describe the number of cases of patients with laryngeal cancer in the Northeast and the possibilities of surgical and therapeutic interventions funded by the Public Service.

**Methods:** a descriptive epidemiological study, which relied on secondary data obtained via query-based Datasus data, collected data for the period from January 2008 to December 2012

**Results:** increasing the number of cases of laryngeal cancer over the years, male predominance, increased number of hospitalizations, partial laryngectomy as a medical procedure most used and the most amount of speech associated with SUS was observed in Pernambuco.

**Conclusion:** information strategy for health promotion and prevention of laryngeal cancer can help to minimize or even reverse the spread of the number of cases.

**Keywords:** Laryngeal Neoplasms; Speech, Language and Hearing Sciences; Delivery of Health Care.

## RESUMO

**Objetivo:** caracterizar a assistência hospitalar em pacientes com câncer de laringe, na perspectiva da intervenção cirúrgica e reabilitação fonoaudiológica ofertada pelo Sistema Único de Saúde (SUS) na região Nordeste.

**Métodos:** estudo epidemiológico descritivo, que contou com dados secundários obtidos via consulta à base de dados DATASUS, tendo levantado informações referentes ao período de janeiro de 2008 a dezembro de 2012.

**Resultados:** aumento do número de casos de câncer de laringe com o passar dos anos, predominância do sexo masculino, aumento no número de internações, laringectomia parcial como procedimento médico mais utilizado e a maior quantidade de fonoaudiólogos vinculados ao SUS foi observada em Pernambuco.

**Conclusão:** a assistência hospitalar aos pacientes com câncer de laringe contempla estratégias como procedimentos cirúrgicos e intervenção fonoaudiológica. Faz-se necessário que essa assistência contemple aspectos direcionados à prevenção de doenças, pois a informação em saúde, por meio de estratégias educativas, pode contribuir para o diagnóstico precoce e tratamento da doença.

**Descritores:** Neoplasias Laríngeas; Fonoaudiologia; Assistência à Saúde.

## INTRODUCTION

Laryngeal cancer is a public health issue in Brazil. The public diagnosis of the former president, Lula, triggered a surge in information about causes, symptoms and treatments associated with this illness, leading investigation and treatment services to become more attentive in the search for diagnoses and in providing care to patients who need publicly-funded health services.

Brazil's Unified Health System (SUS) is considered a model of innovation in the health and citizenship arena, having revolutionized the health care provided to Brazilians. Among its strategies to deal with the population's health is the organization of public health care services according to its basic guidelines: universal, equal and integral care. Accordingly, the healthcare initiatives must obey the fundamental principles of regionalization, hierarchy, resolution, and social participation, in order to provide easier access to users who live in areas far from health centers<sup>1</sup>.

Estimates suggest that laryngeal cancer is the 11<sup>th</sup> most frequent type of cancer in the world, with an estimated incidence adjusted by age of 5.7/100,000<sup>2</sup> worldwide, with a greater prevalence among men, which may be explained by the patterns of exposure to the risk factors for this type of cancer<sup>3</sup>.

The large number of individuals with laryngeal illnesses in Brazil led to the conduction of the Voice Campaign, which has been very successful in guiding the population on how to care for their vocal health and how to prevent laryngeal illnesses<sup>4</sup>. An early cancer diagnosis and the appropriate treatment can ensure a better prognosis to cancer patients<sup>5</sup>. The severity of comorbidity conditions may be graded according to their impact on the adopted treatment and life expectancy<sup>6</sup>. A recent study<sup>7</sup> on the time elapsed between the diagnosis and the beginning of the laryngeal cancer treatment in a hospital that is a benchmark for these cases found that the average time between the first doctor's appointment and the beginning of treatment was 49 days.

The public health system benefits from an early cancer diagnosis, especially when this diagnosis is reached in primary care<sup>8</sup>. The costs of laryngeal cancer treatment, radiotherapy and hospitalization are the main drivers of hospital expenses<sup>9</sup>.

Primary prevention in cases of laryngeal cancer involves programs developed with the aim of controlling cigarette smoking in order to minimize or prevent cancer in healthy individuals. When this form

of prevention becomes inefficient, the next resource is to emphasize the importance of early detection and treatment in time for a cure<sup>10</sup> or at least to preserve organs. In cases with poor prognosis, it is important to consider the patient's expectations, and palliative care becomes the therapeutic alternative responsible for ensuring the patient a better quality of life<sup>11</sup>.

Among specialized services, speech therapy is one of the rehabilitation treatments for laryngeal cancer. The growing number of scientific studies on this topic has reaffirmed the relevance of this field in the speech therapy practice<sup>5</sup>.

This study aims to describe the hospital care provided to patients with laryngeal cancer in the Northeast of Brazil and the possibilities of surgical intervention and speech rehabilitation funded by Brazil's unified health system (SUS)

## METHODS

This is a descriptive, cross-sectional, observational epidemiological study, based on secondary data obtained from the DATASUS database, recorded in the Hospital Information System of the SUS (SIH/SUS). The data collected referred to the hospital admissions due to laryngeal malignant neoplasms (cancer), as well as to the number of individuals submitted to partial laryngectomy, total laryngectomy and total laryngectomy with neck dissection between 2008 and 2012. We chose 2012 as the final year for analysis because the hospitalization data referring to 2013 were still preliminary.

We also searched the Brazilian Registry of Health Establishments (CNES) for supplementary information on the public health care network structure that includes speech therapists for speech intervention in laryngeal cancer patients.

The data were obtained on the internet, from the public domain websites <<http://www.datasus.gov.br>> and <<http://cnes.datasus.gov.br/>>, and referred to the period between 2008 and 2012. As they are both public domain databases, it was not necessary to submit the project to the Research Ethics Committee.

In order to analyze the prevalence of laryngeal cancer among the population of each state of Northeastern Brazil, we calculated the prevalence coefficient, which allowed us to standardize the particularities of the population of each state, namely, the number of hospital admissions due to laryngeal cancer/population x 10n. The population was as determined by the latest census conducted by the Brazilian Geography and Statistics Institute (IBGE) in 2010.

From the data obtained on the DATASUS and with the purpose of making analysis easier, these data were organized in an electronic spreadsheet, from which the information was analyzed and displayed in tables.

## RESULTS

According to the data shown in Table 1, between the years 2008 and 2012 there was an increase in the

number of cases of people from the Northeast of Brazil with laryngeal cancer, with 2012 having recorded the largest number of cases.

Based on the search of the SIH database we observed a larger number of cases of laryngeal cancer among males. As to the analysis of the prevalence coefficient, it showed a higher prevalence in the state of Rio Grande do Norte, followed by Ceará, Bahia, Alagoas and Pernambuco.

**Table 1.** Hospital admissions due to malignant tumors of the larynx in the Northeast of Brazil, from 2008 to 2012

Year	Hospital Admissions	
	n	%
2008	1,417	18.9
2009	1,459	19
2010	1,541	20.5
2011	1,508	20.1
2012	1,578	21.5
TOTAL	7,503	100

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

**Table 2.** Breakdown of Hospital Admissions due to malignant tumors of the larynx according to sex and prevalence coefficient, from 2008 to 2012

State	Gender				Population according to the IBGE (2010)	Prevalence Coefficient
	Male		Female			
	n	%	n	%		
Alagoas	301	66	155	34	3,120,494	0.146
Bahia	1,752	83.9	336	16.1	14,016,906	0.148
Ceará	1,223	77.6	353	22.4	8,452,381	0.186
Maranhão	238	79.3	62	20.7	6,574,789	0.045
Paraíba	373	84.2	70	15.8	3,766,528	0.117
Pernambuco	916	83.9	176	16.1	8,796,448	0.124
Piauí	247	87.6	35	12.4	3,118,360	0.090
Rio Grande do Norte	921	82.6	194	17.4	3,168,027	0.351
Sergipe	124	82.1	27	17.9	2,068,017	0.073

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

Table 3 shows the number of hospital admissions due to malignant neoplasms of the larynx among individuals residing in the Northeast of Brazil according to place of residence. From the total 7,503 cases, Bahia had the largest number of hospitalizations (2,088, or 27.8%). The state of Ceará ranked second, with 1,576 hospitalizations (21%), followed by Rio Grande do Norte, with 1,115 hospital admissions (14.9%). The state of Sergipe had the smallest number of hospitalizations,

151, corresponding to 2% of the total number recorded in the Northeast during the period analyzed.

The breakdown of the total 834 partial laryngectomies performed under the SUS between 2008 and 2012 (table 4) was larger in the following Northeastern states: 407 surgeries were performed in Ceará (48.8%), 215 in Bahia (25.8%), and 110 in Pernambuco (13.2%). The state with the fewer surgeries performed was Sergipe, with only two procedures (0.25%).

**Table 3.** Hospital admissions due to malignant tumors of the larynx according to place of residence in the Northeast of Brazil and year (2008 to 2012)

Year	AL		BA		CE		MA		PB		PE		PI		RN		SE	
	n	%	N	%	n	%	N	%	n	%	N	%	n	%	n	%	n	%
2008	27	5.9	413	19.8	298	18.9	69	23.0	72	16.2	248	22.7	48	17	207	18.6	35	23.1
2009	93	20.4	410	19.6	334	21.2	49	16.3	80	18.1	231	21.2	60	21.3	175	15.7	27	17.9
2010	119	26.1	373	17.9	351	22.3	55	18.3	85	19.2	211	19.3	64	22.7	266	23.9	17	11.3
2011	119	26.1	442	21.2	320	20.3	56	18.7	77	17.4	183	16.7	52	18.4	238	21.3	21	13.9
2012	98	21.5	450	21.5	273	17.3	71	23.7	129	29.1	219	20.1	58	20.6	229	20.5	51	33.8
TOTAL	456	100	2,088	100	1,576	100	300	100	443	100	1,092	100	282	100	1,115	100	151	100

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

Abbreviations: AL – Alagoas; BA – Bahia; CE – Ceará; MA – Maranhão; PB – Paraíba; PE – Pernambuco; PI – Piauí; RN – Rio Grande do Norte; SE - Sergipe

Pernambuco, Ceará and Paraíba were the three states with the most total laryngectomies in the period analyzed, having performed 32 (29.1%), 23 (20.9%), and 19 (12.3%) of those surgeries, respectively. It bears emphasizing that the states of Bahia, Maranhão, Piauí, Rio Grande do Norte and Sergipe did not perform any total laryngectomies between 2008 and 2012.

The state of Pernambuco was also the one with the largest number of total laryngectomies with neck dissections under the SUS: 169 procedures (30.5%

of the total) in the period analyzed. Piauí and Sergipe performed 18 surgeries each, whereas in the same period the only such surgery performed in Alagoas was in 2011.

The number of total laryngectomies with neck dissections performed in the other states is shown in Table 4.

Regarding the number of speech therapists who are associated with the SUS, this was larger in Pernambuco, Bahia and Ceará, whereas Sergipe has the fewest of these professionals.

**Table 4.** Total laryngectomies with neck dissections performed in the Northeast of Brazil per year (2008 to 2012)

Year	BA		CE		MA		PB		PE		RN	
	n	%	n	%	n	%	n	%	n	%	n	%
2008	34	33.4	37	27.4	15	42.9	11	32.4	46	27.2	10	23.8
2009	28	27.4	29	21.5	5	14.3	6	17.6	29	17.1	10	23.8
2010	11	10.8	30	22.2	6	17.1	6	17.6	28	16.6	9	21.4
2011	14	13.7	22	16.3	6	17.1	7	20.6	38	22.5	4	9.6
2012	15	14.7	17	12.6	3	8.6	4	11.8	28	16.6	9	21.4
TOTAL	102	100	135	100	35	100	34	100	169	100	42	100

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

Abbreviations: BA – Bahia; CE – Ceará; MA – Maranhão; PB – Paraíba; PE – Pernambuco; RN – Rio Grande do Norte.

**Table 5.** Number of speech therapists associated with the SUS in the Northeast of Brazil

State	Number	
	N	%
Alagoas	174	5.4
Bahia	659	20.35
Ceará	571	17.65
Maranhão	276	8.5
Paraíba	298	9.2
Piauí	224	6.9
Pernambuco	673	20.8
Rio Grande do Norte	253	7.8
Sergipe	109	3.4
TOTAL	3237	100

Source: Ministry of Health – Brazilian Registry of Health Establishments (CNES), 2013.

## DISCUSSION

Laryngeal cancer is considered one of the most common among tumors of the head and neck, corresponding to approximately 25% of malignant tumors of this part of the body, and around 2% of all malignant illnesses<sup>12</sup>.

Authors describe that voice quality, difficulties swallowing and breathing, in addition to smoking and alcohol are factors that create an impact on the quality of life of laryngeal cancer patients and refer to the general well-being and the specific issues associated with head and neck cancers<sup>13</sup>.

Regarding smoking, the literature points toward a factor that is worthy of attention: the progressive rise in the incidence of lung cancer among women, due to this group's increasing exposure to cigarette smoking, which also has an influence on mouth, pharyngeal, laryngeal and esophagus cancers<sup>14</sup>.

Faced with the growing number of cases of laryngeal cancer in a five-year period, one notices the need to conduct an investigation about the factors predisposing to its development. Cigarette smoking, alcohol and other factors specific to the Northeast of Brazil may influence the development as well as the early diagnosis of this type of tumor, such as: dietary habits, schooling and access to health care services.

A study conducted to investigate laryngeal cancer-related mortality in the state of Pernambuco found a concentration of deaths in the *Sertão* (backlands), possibly due to the population's difficulty in accessing health centers, often located far from their homes. This situation leads to a late diagnosis, with the consequence advance of the illness and reduced effectiveness of the treatment. Not surprisingly, the mortality coefficients tend to be more elevated among this population<sup>15</sup>.

Also in the state of Pernambuco<sup>15</sup>, the same hypothesis could justify the high mortality coefficient found on Fernando de Noronha island. Access to specialized health services is precarious, leading to a difficulty in continuing treatment. Consequently, the risk of death in this region becomes elevated. According to the same study<sup>15</sup>, high alcohol consumption on the island is also an important risk factor associated with the development of malignant tumors.

In the city of Salvador, in the state of Bahia, a survey was carried out on the procedures used in the treatment of mouth and oropharyngeal cancer, which determined that, in cases where surgery was recommended, the most frequent types of surgeries performed were those that included neck dissections<sup>16</sup>.

The same study, based on the DATASUS database for surgeries of the larynx, found that the type of surgery generally performed was the total laryngectomy, followed by total laryngectomy with neck dissection<sup>16</sup>. This information does not confirm the results of this research; however, it bears stressing that Bahia ranks second in the number of these procedures.

The states of Bahia and Pernambuco have the largest number of speech therapists associated with the SUS in comparison with the other Northeastern states, and are also the states where the most laryngeal surgeries were performed in the period analyzed.

The state of Pernambuco, which recorded a large number of total laryngectomies, featured in a 2011 study about quality of life, in which 19 patients who underwent the procedure were interviewed. The study showed that the most affected aspects of quality of life were anxiety, speech and humor. In addition, losing their job, social isolation and voice alterations were the changes resulting from the illness most reported by the patients<sup>17</sup>.

Speech therapists, knowing the treatment and the therapeutic frailties that compromise the vocal quality as well as the quality of life of laryngeal cancer patients, should focus their efforts on contributing to these patients' recovery through minimizing the damage caused by the illness and improving their physical conditions<sup>12</sup>. The ability to communicate is strongly associated with an improvement in these individuals' quality of life<sup>18</sup>.

The speech therapy begins at the pre-surgical stage, when the speech therapist should explain to the patient about the rehabilitation that may be needed after the surgery. Some vocal and swallowing measurements are recorded for post-surgical comparison, with the purpose of minimizing possible communication issues that may develop after the treatment<sup>12</sup>.

A study into the vocal and discursive features of 22 male patients who underwent different laryngeal cancer treatments and compared them to normal individuals concluded that all those patients developed or maintained some type of speech source after the treatment, and were able to communicate functionally. Among the subjects were six individuals who underwent a partial laryngectomy and another six who were submitted to a total laryngectomy<sup>19</sup>.

Authors point to videoendoscopy, both at the pre- and post-surgical stages, as an important resource to gather detailed information about the condition of patients' larynxes<sup>20</sup>. This information should be

considered by the speech therapist when drafting his or her therapeutic proposal for treatment of laryngectomy patients.

In a study about nurses' actions involving cancer patients in a city of the state of São Paulo, the authors<sup>21</sup> stated that the degree of knowledge about risk factors for cancer, both by the population in general and by healthcare professionals, may be a determining condition in preventing and controlling this illness. The authors also added that adopting preventive measures when treating cancer patients (effective treatment or rehabilitation) may either help reduce deaths or give these patients a better prognosis.

Based on these considerations, establishing information strategies for health promotion and prevention of new laryngeal cancer cases is a part of a speech therapist's duties, and these professionals can help minimize or even reverse the increase in the number of cases.

## CONCLUSION

This research showed an increase in the number of laryngeal cancer cases in the Northeast of Brazil in the period under analysis, mainly among male individuals. The hospital care provided to these patients includes strategies such as surgical procedures and speech therapy. The patients' access to these strategies in the public health system varies depending on the state. Also, according to data obtained on the DATASUS, there has been an upturn in the number of hospitalizations due to laryngeal cancer. The most adopted medical procedure in these cases is the partial laryngectomy, most frequent in the states of Pernambuco and Bahia, respectively. The state of Pernambuco has the largest number of speech therapists associated with the SUS. Therefore, this study suggests that these professionals play an important role in cases of laryngeal cancer, by monitoring as well as referring these individuals to the proper medical specialists. Hospital care should involve aspects geared toward preventing cancer, as health information conveyed by means of educational measures may contribute to the early diagnosis and treatment of this illness.

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