

# Oral changes in patients submitted to treatment for malignant tumours in the head and neck region

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• **Conflicts of interest:** none declared.

## ABSTRACT

**Objective:** to identify the main oral manifestations in patients submitted to treatment for malignant tumours in the head and neck region at an oncology center of in Caruaru, in the countryside of Brazil. **Material and Methods:** this is an observational, cross-sectional, retrospective study accomplished at the Caruaru Oncology Center, through the analysis of 50 charts of patients treated in the Dentistry department in the treatment of cancer in the head and neck region. There was no exclusion according to the sex of the patients, and the sample number was determined for convenience. The charts that lacked information about the treatment, as well as the medical records of those patients who abandoned treatment with the dental team were excluded. **Results:** 74% of the patients were male. 80% were smokers and 72% were alcoholics. All patients received guidance on oral care, but 48% received oral guidance only during antineoplastic treatment. The main oral alteration was mucositis (70%), followed by xerostomia (54%), dysgeusia (50%) and dysphagia (48%). Radiation-induced caries and osteoradionecrosis occurred in only 2% of patients. **Conclusion:** all patients received guidance on oral care by a dentist, but most received this information during and after the antineoplastic treatment. Several oral alterations associated with antineoplastic treatment were observed, with oral mucositis being the most frequent manifestation.

**Keywords:** Stomatology; Oncology; Radiotherapy; Combined Chemotherapy; Oral manifestations.

## Introduction

Cancer is a public health problem, especially among developing countries, and ensuring the population's effective access to the diagnosis and treatment of this disease becomes a major challenge for the health system in several countries of the world.<sup>1</sup>

Statistic data from Brazil, for the biennium 2018-2019, estimates the occurrence of approximately 420,000 new cases of cancer, excluding non-melanoma skin cancer. Head and neck cancer is considered one of the main malignant tumours, due to its high incidence, prevalence and mortality, being the fifth most frequent neoplasm in the world and the second most common type of neoplasm in men aged between 40 and 69 years in Brazil, counting with 17,500 new cases per year, being only behind the prostate cancer.<sup>2</sup>

Head and neck cancer is a multifactorial disease, resulting from the interaction of environmental factors and genetic inheritance. Among the main environmental factors that act as risk factors are smoking, drinking alcohol, human papillomavirus (HPV) infection and exposure to unprotected solar radiation. The oral cavity is the site most affected by this type of cancer, being represented by approximately 40% of the cases, followed by larynx (25%), salivary glands and thyroid (20%) and pharynx (15%). The treatment involves several therapies, such as surgery, radiotherapy (RT) and chemotherapy (CT), which can be used exclusively or combined.<sup>3,4</sup>

These treatments can cause adverse effects or sequelae to patients, and the oral cavity is one of the major sites in the

body where the complications of antineoplastic treatment are passed on. These complications vary according to the type of tumour malignancy, the therapeutic modality used (surgery, radiotherapy, chemotherapy or the combination of these treatments) and the health status of the patient. They can be classified as acute, such as mucositis, dysphagia, dysgeusia, bleeding, presence of opportunistic infections (such as candidiasis), xerostomia and hoarseness; or chronic, mainly associated with radiotherapy, such as pain, radiation-induced caries, tissue fibrosis, trismus, mucosal and/or skin ulcerations, fistulas, facial and neck swelling and osteoradionecrosis.<sup>5,6</sup>

Preventing and controlling oral adverse effects are extremely important, as these complications may interrupt treatment, either temporarily or permanently, compromising patient survival rates, as well as increasing treatment time and cost and decrease the motivation of the patient to continue the therapeutic planning, repercussions on the prognosis and quality of life of the patient.<sup>7</sup>

The correct understanding of the signs and symptoms and the correlation of these alterations with the main therapies used facilitates the prevention and treatment of these conditions, providing a better quality of life to the patient, which requires dentistry integrated to the oncology multi-professional team.<sup>8</sup>

Thus, the objective of this study was to identify the main oral alterations in patients submitted to treatment for malignant tumours in the head and neck region at a center of oncology in the countryside of the state of Pernambuco.

## Material and Methods

A retrospective cross-sectional study was carried out through the analysis of 50 medical records of patients from the Dentistry Department of the Caruaru Oncology Center (CEOC), located in the city of Caruaru, Brazil. All of them underwent to treatment for malignant tumour in the head and neck region from March 2016 to April 2018.

This project was submitted to the ASCES/UNITA Ethics Committee in Research with Human Beings, being approved under the protocol number 2.646.466, respecting the Resolution No. 466/2012 of the National Commission of Ethics in Research.

The information found in patients' charts was recorded in a file created by the researchers, to facilitate the data organization. In the medical records, the oral changes found during the care were described, whether or not the patient received oral care guidance, treatment instituted when there was any type of injury, and the patient's progress.

The medical records lacking information about the treatment, as well as the those of patients who abandoned treatment with the dental team were excluded from the study. There was no exclusion according to the sex of the patients, and the sample number was determined for convenience. The collected data were tabulated and categorized in Microsoft Office Excel 2010, being analysed statistically in the same program and presented through descriptive statistics as absolute (numbers) and relative (percentage) frequencies.

## Results

There were 84 medical files for analysis, however, due to the absence of information on histological type of tumour, besides death and abandonment of the treatment by the patients, only 50 medical records were included in the study, according to figure 1. 74% of the sample were men and 26% women, being the most frequent age group between 45 and 60 years old (44%). In addition, 80% of the sample had a smoking habit and 72% a habit of drinking alcohol, as shown in Table 1.

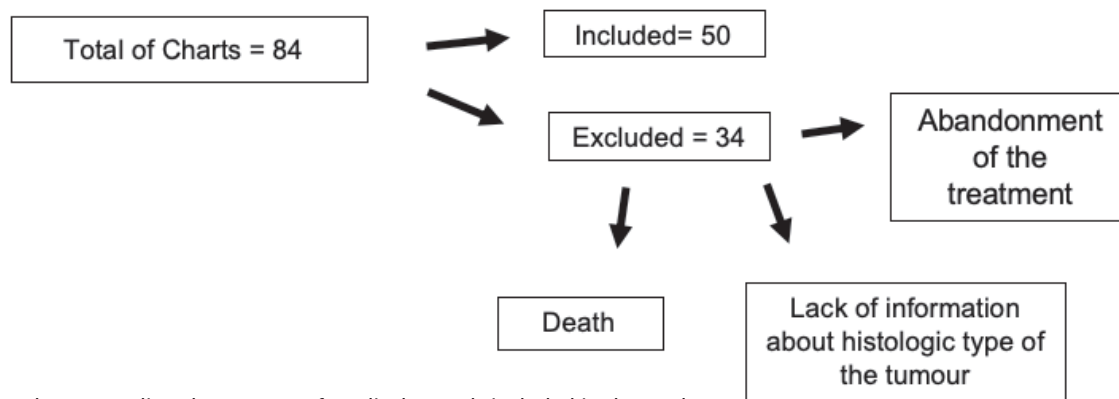
**Table 1.** Characterization of the sample in relation to age, sex and smoking habits and alcoholic beverage

VARIABLES	n	%
<b>Age</b>		
18-24 years	0	0
25-44 years	7	14
45-60 years	22	44
Over 60 years	21	42
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Sex</b>		
Male	37	74
Female	13	26
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Smoking</b>		
Yes	40	80
No	10	20
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Alcoholism</b>		
Yes	36	72
No	14	28
<b>Total</b>	<b>50</b>	<b>100</b>

According to Tables 2 and 3, both smokers and those reporting alcohol use were male, aged 45-60, mostly.

**Table 2.** Characterization of the sample of smoking patients

VARIABLES	n	%
<b>Age</b>		
18-24 years	0	0
25-44 years	4	10
45-60 years	20	50
Over 60 years	16	40
<b>Total</b>	<b>40</b>	<b>100</b>
<b>Sex</b>		
Male	31	77.5
Female	9	22.5
<b>Total</b>	<b>40</b>	<b>100</b>



**Figure 1.** Flowchart regarding the amount of medical records included in the study

**Table 3.** Characterization of the sample of alcoholic patients

VARIABLES	n	%
<b>Age</b>		
18-24 years	0	0
25-44 years	6	16.7
45-60 years	19	52.8
Over 60 years	11	30.5
<b>Total</b>	<b>36</b>	<b>100</b>
<b>Sex</b>		
Male	32	88.9
Female	4	11.1
<b>Total</b>	<b>36</b>	<b>100</b>

Regarding drinking habits and smoking habits, it was found that 66% of the sample used alcohol and tobacco, and when evaluated separately, it was verified that 14% of the patients had a smoking habit and only 6% the habit of drinking alcohol (Table 4).

**Table 4.** Relation between the habit of drinking and smoking

		<b>Drinking</b>		
		<b>No</b>	<b>Yes</b>	<b>Total</b>
<b>Smoking</b>	No	7	3	10
	Yes	7	33	40
	<b>Total</b>	<b>14</b>	<b>36</b>	<b>50</b>

**Table 5.** Treatment Performed, Histological characteristics and Topography of Head and Neck Tumours

VARIABLES	n	%
<b>Treatment</b>		
Chemotherapy	0	0
Radiotherapy	3	6
Radiotherapy + Chemotherapy	47	94
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Tumour site</b>		
Tongue	13	26
Buccal mucosa	1	2
Lower lip	2	4
Maxillary sinus	1	2
Floor of the mouth	2	4
Mandibular body	1	2
Larynx	7	14
Pharynx (oropharynx, hypopharynx and nasopharynx)	13	26
Palate (Hard and/or Soft)	6	12
Salivary glands	3	6
Maxilla	1	2
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Histologic type of the tumour</b>		
Squamous cell carcinoma	46	92
Carcinoma ex-pleomorphic adenoma	1	2
Leiomyosarcoma	1	2
Polymorphus low grade adenocarcinoma	1	2
Adenoid Cystic Carcinoma	1	2
<b>Total</b>	<b>50</b>	<b>100</b>

The main treatment was radiotherapy concomitant with chemotherapy (94%), and only three patients underwent exclusive radiotherapy. The main histological type was squamous cell carcinoma (92%), while leiomyosarcoma, polymorphous low grade carcinoma, pleomorphic ex-adenoma carcinoma and cystic adenoid carcinoma were also found. The main affected regions were the tongue and the pharynx (26%), followed by the larynx (14%) and the palate (12%), as detailed in Table 5.

According to Table 6, all patients reported receiving guidance on oral care, however, more than half of the sample (58%) received these guidelines only during and after the antineoplastic treatment.

**Table 6.** Information about oral care

VARIABLES	n	%
<b>Guidance on oral care</b>		
Yes	50	100
No	0	0
<b>Total</b>	<b>50</b>	<b>100</b>
<b>Moment of the treatment when the guidance was provided</b>		
Before the onset of the treatment	21	42
During the treatment	24	48
After the treatment	5	10
<b>Total</b>	<b>36</b>	<b>100</b>

The main oral alteration associated with the antineoplastic treatment was mucositis (70%), followed by xerostomia (54%) and dysgeusia, represented by half of the sample (Table 7).

**Table 7.** Main oral alterations related to the antineoplastic therapy

	Mucosit*		Xerost*		Dysgeus*		Dysphag*		Candid*		Trism		RIC*		Osteorad*	
	F*	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
No	15	30	23	46	25	50	26	52	45	90	45	90	49	98	49	98
Yes	35	70	27	54	25	50	24	48	5	10	5	10	1	2	1	2
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>

Mucosit\*- Mucositis; Xerost\*- Xerostomia; Dysgeus\*- Dysgeusia; Dysphag\*- Dysphagia; RIC\* - Radiation-induced caries; Osteorad\* - Osteoradionecrosis and F\* - frequency

## Discussion

After analysis of the 50 charts, a higher frequency of head and neck cancer was found in male patients, aged 45 to 60 years old, who had associated smoking habits and alcoholism, corroborating with the data present in the current literature.<sup>7,9,10</sup> This is possibly justified because men generally present harmful habits, such as alcohol consumption and smoking, more often than women, and the intensity and duration of these habits also influence the risk to the development of head and neck tumours, since it takes time until install the disease, which would explain the onset of the disease in the more senile phases of life.

Regarding the histological type of the tumour and its location, the results of the study agree with several authors,<sup>11-14</sup> which show that squamous cell carcinoma represents more than 90% of cases of head and neck malignant tumours, appearing normally in the oral cavity, oropharynx, hypopharynx or larynx, with the tongue being the region most affected by malignant tumours involving the mouth.

The clinical staging of head and neck cancer and its location influence the therapeutic approach, and in most cases, surgical resection is the first choice of treatment.<sup>15</sup> In the present research, most patients were treated by the combination of RT and CT, agreeing with one study,<sup>14</sup> but differing from another,<sup>7</sup> which had the surgery associated with RT the most used form of treatment. This may be explained by the fact that the majority of patients treated at the Caruaru Oncology Center had the locally advanced disease unresectable, and combined treatment are recommended for these cases.

All patients received guidance on oral care, however, all the charts evaluated belonged to the Dentistry sector, indicating that all of them were attended by a dental surgeon at some point in the antineoplastic treatment and that they therefore received care and/or guidelines on oral health.

However, most of the patients received the first guidelines during and after the antineoplastic treatment, agreeing

with some Brazilian studies,<sup>16,17</sup> which verified that most of the patients did not receive dental treatment prior to cancer therapy, and no additional information was provided about your oral health condition. This reflects the lack of medical referral to dentistry before starting the antineoplastic treatment,

making difficult to properly apply oral care guidelines, preparation and adequacy of the mouth in order to prevent late complications, such as osteoradionecrosis, and improve comfort and quality of life of the patient.

It is also worth noting that all medical records evaluated were from patients submitted to treatment for head and neck malignant tumours, which leads to major side effects on the oral cavity and consequently may justify the patients' demand for dental service during treatment. In general, when cancer does not involve the oral cavity, patients only seek for a dentist when they notice an important change in their mouth.<sup>16</sup>

Oral effects can be observed during and after antineoplastic therapy in approximately 90% of patients with head and neck cancer.<sup>16</sup> In the present study, the main oral alteration was mucositis, followed by xerostomia and dysgeusia, agreeing with a Brazilian study performed in Santa Catarina,<sup>16</sup> even though it differs from another article<sup>17</sup> that observed xerostomia as the most frequent alteration, followed by mucositis and candidiasis.

Mucositis is one of the major side effects related to antineoplastic treatments, especially when it involves the head and neck region. It causes pain speech, swallowing and hygiene problems for the patient, and predispose the patient to infections and/or interruption of the treatment, ending up as a very significant change.<sup>18</sup> In addition, the concomitant use of RT and CT can generate a prolonged and severe mucositis,<sup>19</sup> which could justify the results found in our study.

Nevertheless, all oral alterations may compromise the patient's systemic health, prolong hospital stay, reduce survival, and contribute to increased treatment costs, directly affecting the quality of life. Thus, the presence of the dentist in the multidisciplinary oncology team is essential to improve the supportive care to patients.

The role of the dental surgeon in the multiprofessional team involves, besides the early diagnosis of malignant lesions, the care previous to antineoplastic therapy through

the adaptation of the oral environment in order to minimize local and systemic infection during and after treatment oncological.<sup>21</sup> Thereby, it is necessary to raise the awareness of the medical team, through campaigns and lectures, to perform referral to dentist previously to the beginning of the antineoplastic treatment, especially when the cancer involves head and neck region.

Besides of highlighting the importance of dentists in the treatment of cancer patients, the present study provides enough data for creation of protocols for dental care for the service where the research was carried out, taking into ac-

count the oral alterations found, with the aim of guaranteeing minimal oral sequelae and greater comfort and quality of life for the patients.

## Conclusion

Several oral changes associated with antineoplastic treatment were observed, with oral mucositis being the most frequent manifestation. In addition, although all patients had guidance on oral care, most of them received this information only during and after the antineoplastic treatment.

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## Mini Curriculum and Author's Contribution

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