Characterization of Oral Cavity and Pharyngeal Cancer Cases in Northern Brazil, 2012-2015

Caracterização dos Casos de Câncer de Cavidade Oral e Faringe da Região Norte do Brasil, 2012-2015

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ABSTRACT

Introduction: Oral cavity and pharyngeal cancer is a public health problem with high incidence and mortality rates. **Objective:** To characterize the clinical-epidemiological profile and delays in diagnosis and treatment of cases of oral cavity and pharyngeal cancer treated in reference units in Brazil's North Region. **Method:** Descriptive study of oral cavity and pharyngeal cancer registered in the Hospital-based Cancer Registry (HBCR) in the North Region from 2012 to 2015. The intervals between the 1st consultation and diagnosis and diagnosis and treatment were analyzed. Continuous variables were evaluated using measures of central tendency and dispersion. Differences between proportions in categorical variables were assessed using the chi square test, considering a significance level of 5%. **Results:** Among men, cases of oropharynx were more incidents (19.2%) and in women, the most incidents (16.3%) were from other parts and unspecified parts of the tongue. Most of the cases were males, Brown, >60 years old, without spouse and elementary education. Squamous cell carcinoma was the most common. 69.6% of cases that arrived at the hospital without diagnosis and without treatment were diagnosed within 30 days after the 1st consultation and 67.8% of cases received the 1st treatment within 60 days. **Conclusion:** Most of the cases analyzed were diagnosed within the recommended timeframe. However, cases with diagnosis and without treatment took more than 60 days.
Key words: mouth neoplasms; oropharyngeal neoplasms; epidemiology, descriptive; time-to-treatment; hospital records.

RESUMO

Introdução: O câncer de cavidade oral e faringe é um problema de saúde pública, apresentando elevadas taxas de incidência e mortalidade. **Objetivo:** Caracterizar o perfil clínico-epidemiológico e os atrasos no diagnóstico e tratamento de casos atendidos nas unidades de referência da Região Norte do Brasil. **Método:** Estudo descritivo dos casos de câncer de cavidade oral e faringe registrados nas bases de dados dos Registros Hospitalares de Câncer (RHC) de 2012 a 2015. Foram analisados os intervalos entre a primeira consulta e o diagnóstico, e o diagnóstico e o tratamento. As variáveis contínuas foram avaliadas por meio de medidas de tendência central e de dispersão. As diferenças entre proporções nas variáveis categóricas foram avaliadas pelo teste qui-quadrado, considerando-se o nível de significância de 5%. **Resultados:** Entre os homens, os casos de orofaringe foram mais incidentes (19,2%) e nas mulheres os mais incidentes (16,3%) de outras partes e partes não especificadas da língua. A maior parte dos casos era de homens, cor parda, >60 anos, sem cônjuge, com escolaridade até o nível fundamental. O carcinoma de células escamosas foi o mais comum. Com relação ao tempo, 69,6% dos casos que chegaram ao hospital sem diagnóstico e sem tratamento foram diagnosticados até 30 dias após a primeira consulta, e 67,8% dos casos receberam o primeiro tratamento em até 60 dias. **Conclusão:** A maioria dos casos analisados apresentou tempo de diagnóstico dentro do prazo recomendado, porém foi observado que os casos com diagnóstico e sem tratamento demoraram mais de 60 dias.
Palavras-chave: neoplasias bucais; neoplasias orofaríngeas; epidemiologia descritiva; registros hospitalares; tempo para o tratamento.

RESUMEN

Introducción: El cáncer de cavidad oral y faringe es un problema de salud pública, con altas tasas de incidencia y mortalidad. **Objetivo:** Caracterizar el perfil clínico-epidemiológico y las demoras en el diagnóstico y tratamiento de los casos de cáncer de cavidad oral y faringe atendidos en unidades de referencia del Norte de Brasil. **Método:** Se realizó un estudio descriptivo de los casos analíticos de cáncer de cavidad oral y faringe registrados en las bases de datos del Registros Hospitalarios de Cáncer (RHC) en la Región Norte de 2012 a 2015. Se analizaron los intervalos entre la primera consulta y el diagnóstico y diagnóstico y tratamiento. Las variables continuas se evaluaron mediante medidas de tendencia central y dispersión. Las diferencias entre proporciones en variables categóricas se evaluaron mediante la prueba chi cuadrado, considerando un nivel de significancia del 5%. **Resultados:** Entre los hombres, los casos de orofaringe fueron más incidentes (19,2%) y entre las mujeres los de otras partes y partes no especificadas del idioma fueron los más incidentes (16,3%). La mayoría de los casos fueron del sexo masculino, moreno, >60 años, sin pareja, con educación hasta el nivel elemental. El carcinoma de células escamosas fue el más común. En cuanto al tiempo, el 69,6% de los casos que llegaron al hospital sin diagnóstico y sin tratamiento fueron dentro de los 30 días posteriores a la primera consulta y el 67,8% de los casos recibieron el 1er tratamiento dentro de los 60 días. **Conclusión:** La mayoría de los casos analizados presentaron tiempo de diagnóstico dentro del período recomendado. Sin embargo, se observó que los casos con diagnóstico y sin tratamiento demoran más de 60 días.
Palabras clave: neoplasias de la boca; neoplasias orofaríngeas; epidemiología descriptiva; tiempo de tratamiento; registros de hospitales.

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INTRODUCTION

Head and neck cancers include lips, oral cavity, pharynx, larynx, salivary glands and thyroid among other[1]. In 2020, the sites involving oral cavity alone (C00-C08) affected more than 400 thousand persons in the world and if pharynx neoplasms (C09-C14) are included, it exceeds 700 thousand, corresponding to a standardized incidence rate per age of 8.2/100 thousand persons[2].

In Europe, the standardized incidence ratio per age in 2020 for mouth and pharynx cancer was 9.3/100 thousand inhabitants. In Brazil, for the same year, the incidence ratio for these neoplasms reached 7.1/100 thousand[2], ranking fourth among the most incident sites in males with an incidence ratio adjusted of 10.8/100 thousand, while for females the ratio was 2.9/100 thousand, the 14th among the most incident neoplasms[3].

At Brazil's North Region, higher lethality rates by mouth and pharynx cancer were found in the period from 2008 to 2017[4]. The proportional mortality by neoplasms of the oral cavity for men and women in 2019 was equal to 0.37 of all the deaths in the same period[5].

The literature suggests multifactorial etiology of mouth and pharynx cancer, the most known factors are age > 40 years, males, tobacco and alcohol use, infection by human papilloma virus (HPV) and ultraviolet solar radiation (for lip cancer cases)[6,7]. However, the epidemiological profile of these neoplasms may vary according to the geographical region due to ethnicity diversity, variation of prevalence of environmental exposures along the years and access to health services[8,9].

Although the profile of the neoplasms is useful both for the investigation of etiological hypothesis and as material to plan prevention strategies, diagnosis and disease control[8], studies evaluating the profile of mouth and pharynx cancers are still scarce at the Cancer Hospital Registries (RHC)[10], that cover all the cancer cases consulted by the National Health System (SUS). In addition, the evaluation of the delays of diagnostic and beginning of treatment are relevant as they reflect the access to health services and are related to early diagnosis[9].

Studies characterizing the profile of patients with mouth and pharynx cancers are conducted more frequently in Brazil's South, Southeast and Northeast regions[11-14]. Although three studies at the North region have evaluated the profile of cases of oral and pharynx cancers, the analyzes addressed head and neck neoplasms jointly in general and they failed to evaluate the states where there was migration from one State to another seeking for treatment out of the residence when access is difficult in the origin State[15-17].

The present study aimed to characterize the epidemiological profile of oral cavity and pharynx cancer at Brazil's North Region between 2012 and 2015 and analyze the interval between the first visit, diagnosis and beginning of treatment based in RHC data[10].

METHOD

Descriptive, observational study of the profile of oral cavity and pharynx cancers consulted at a SUS oncological reference center at the North Region, whose data were collected by "*IntegradorRHC*"[10]. The review by the Institutional Review Board (IRB) was waived in compliance with Resolution 466/12[18] and complements.

The study population consisted in analytical cases of oral cavity and pharynx cancers (C01-C14, except C07, C08 and C11)[3] registered at RHC at the North Region and consulted from 2012 to 2015. These anatomic sites were selected because of similar risk factors; only cases whose treatments were planned and conducted by the reporting hospital were included (analytical).

The cases were stratified according to sex and anatomic site affected (oral cavity, pharynx and both jointly), evaluated according to the variables extracted from RHC file[19], classified in demographic variables and lifestyle, variables of characterization of diagnosis and variables of characterization of the neoplasm and treatment. The differences among the variables were analyzed through Fisher's exact or chi-square test with level of significance of 5%.

The characterization of the distribution of the cases in the study period was made through distribution by site, staging at diagnosis, Federation Unit (UF) of the RHC and time between the first visit and diagnosis and between the diagnosis and beginning of the treatment according to the year of the consultation (2012-2015).

To investigate the time between the first visit, diagnosis and beginning of the treatment, an analysis of the cases referred for the first hospital consultation without diagnostic and treatment, followed by the analysis of the cases with diagnosis and without treatment (for this second group, the analysis of the time between the first visit and the diagnosis was not made) were conducted. The cases with inconsistent data in relation to the flow, those without treatment information and those with no treatment were excluded.

The time variables were analyzed through measures of central tendency and dispersion and the differences among the distribution were evaluated by non-parametric Mann Whitney U and Kruskal-Wallis tests. Next, they were categorized in ≤15 days , 16-30 days and >30 days for the time between the first visit and the diagnosis; and

≤60 days and >60 days for the time between the diagnosis and beginning of the treatment.

All the analyzes were made with the software Statistical Package for Social Sciences (SPSS) version 20.0.

RESULTS

Of the 67.7% of the analytical cases of oral cavity, pharynx and salivary glands (C01-C14) registered between 2012 and 2015 at the RHC[10] of the States of the North Region as shown in Table 1, considering the sites grouped, most of the cases occurred in male patients (71.7%), the most frequent (19.2%) were oropharynx (C10); the cases of other and unspecified parts of the tongue (C02) were more frequent (16.3%) in females. The State of Pará had the greatest number of registries both for men (34.2%) and women (37.3%).

Of the cases of oral cavity and pharynx cancers in men, higher frequencies were found in ≥60 years old (44.2%) individuals, self-claimed Brown skin color (76.4%), with spouse (54.0%) and complete elementary school (60.6%). Among women, ≥60 years of age (52.2%), Brown color (82.2%) and complete elementary school (65.0%). Men presented statistically higher current alcohol use (42.9%) and tobacco (42.4%) (p<0.001) compared to women (24.4% and 32.3%, respectively) as shown in Table 2.

Higher frequency of pharynx cancer (C09-C14, except C11) were found in men ≥60 years (49.6%),

Table 1. Distribution of analytical cases of oral cavity, salivary glands and pharynx cancers (C01-C14) according to ICD-O-33 and the reporting State, North Region, Brazil, 2012-2015

| Variables | Oral Cavity (C01-C06) | | Pharynx (C09-C14) | | | | | | Parotid gland (C07) | | Other salivary glands (C08) | | Oral cavity, salivary glands and pharynx (C01-C14) | |
| | | | Oropharynx (C09, C10, C14) | | Nasopharynx (C11) | | Hypopharynx (C12, C13) | | | | | | | |
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
n (%)	362 (100)	160 (100)	182 (100)	52 (100)	52 (100)	27 (100)	54 (100)	8 (100)	31 (100)	18 (100)	18 (100)	11 (100)	699 (100)	276 (100)
Topography														
C01	61(16.9)	17 (10.6)	–	–	–	–	–	–	–	–	–	–	61 (8.7)	17(6.2)
C02	118 (32.6)	45 (28.1)	–	–	–	–	–	–	–	–	–	–	118 (16.9)	45(16.3)
C03	10 (2.8)	8 (5.0)	–	–	–	–	–	–	–	–	–	–	10 (1.4)	8(2.9)
C04	58 (16.0)	22 (13.8)	–	–	–	–	–	–	–	–	–	–	58 (8.3)	22(8.0)
C05	53 (14.6)	38 (23.8)	–	–	–	–	–	–	–	–	–	–	53 (7.6)	38(13.8)
C06	62 (17.1)	30 (18.8)	–	–	–	–	–	–	–	–	–	–	62 (8.9)	30(10.9)
C07	–	–	–	–	–	–	–	–	31 (100)	18 (100)	–	–	31 (4.4)	18(6.5)
C08	–	–	–	–	–	–	–	–	–	–	18 (100)	11 (100)	18 (2.6)	11(4.0)
C09	–	–	38 (20.9)	15 (28.8)	–	–	–	–	–	–	–	–	38 (5.4)	15(5.4)
C10	–	–	134 (73.6)	33 (63.5)	–	–	–	–	–	–	–	–	134 (19.2)	33(12.0)
C11	–	–	–	–	52 (100)	27 (100)	–	–	–	–	–	–	52 (7.4)	27(9.8)
C12	–	–	–	–	–	–	4 (7.4)	0 (0.0)	–	–	–	–	4 (0.6)	0(0.0)
C13	–	–	–	–	–	–	50 (92.6)	8 (100)	–	–	–	–	50 (7.2)	8(2.9)
C14	–	–	10 (5.5)	4 (7.7)	–	–	–	–	–	–	–	–	10 (1.4)	4(1.4)
p-value	0.051		0.360		–		1.000		–		–		0.003	
States*	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Acre	11 (3.0)	6 (3.8)	6 (3.3)	2 (3.8)	3 (5.8)	5 (18.5)	1 (1.9)	0 (0.0)	0 (0.0)	2 (11.1)	0 (0.0)	1 (9.1)	21 (3.0)	16 (5.8)
Amazonas	82 (22.7)	25 (15.6)	49 (26.9)	11 (21.2)	12 (23.1)	6 (22.2)	3 (5.6)	1 (12.5)	6 (19.4)	3 (16.7)	2 (11.1)	0 (0.0)	154 (22.0)	46 (16.7)
Amapá	11 (3.0)	2 (1.2)	8 (4.4)	4 (7.7)	1 (1.9)	1 (3.7)	0 (0.0)	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	2 (18.2)	21 (3.0)	9 (3.3)
Pará	144 (39.8)	76 (47.5)	40 (22.0)	11 (21.2)	17 (32.7)	6 (22.2)	19 (35.2)	3 (37.5)	11 (35.5)	4 (22.2)	8 (44.4)	3 (27.3)	239 (34.2)	103 (37.3)
Rondônia	61 (16.9)	19 (11.9)	43 (23.6)	15 (28.8)	10 (19.2)	3 (11.1)	21 (38.9)	3 (37.5)	2 (6.5)	3 (16.7)	7 (38.9)	1 (9.1)	144 (20.6)	44 (15.9)
Tocantins	53 (14.6)	32 (20.0)	36 (19.8)	9 (17.3)	9 (17.3)	6 (22.2)	10 (18.5)	1 (12.5)	11 (35.5)	6 (33.3)	1 (5.6)	4 (36.4)	120 (17.2)	58 (21.0)
p-value	0.088		0.849		0.455		0.935		0.316		0.027		0.046	

(*) The State of Roraima did not report any case in the study period.

Brown skin color (70.4%), complete elementary school (68.0%) who lived with spouse (59.1%). Similarly, higher frequencies were found for Brown color (84.3%), complete elementary school (62.0%) and living with spouse (51.9%). The frequency of alcohol use was statistically different (p=0.001) for men (43.8%) and women (25.6%), the same pattern for tobacco use in men (42.9%) and women (36.2%), but without statistical significance (p=0.085) according with Table 2.

Nearly 60% of the cases during the study years were in the oral cavity and >70% in stages III-IV, without statistically significant variations along the time. Pará appears as the North Region State with more registries of oral cavity and pharynx for this period, except in 2014. The time between diagnosis and beginning of treatment varied for the cases with beginning of treatment in up to 60 days after the diagnosis with frequencies ranging from 40.3% in 2013 and 56.1% in 2014. Except 2014, more than 50% of

Table 2. Distribution of sociodemographic characteristics and lifestyle of analytical cases of cancer of oral cavity and pharynx of the North Region, Brazil, 2012-2015

Variables	Oral cavity (C01-C06)			Pharynx (C09-14, except C11)			Oral cavity and pharynx (C01-14, except C07, C08 and C11)		
	Men	Women	p-value	Men	Women	p-value	Men	Women	p-value
*n (%)	362 (100.0)	160 (100.0)		236 (100.0)	60 (100.0)		598 (100.0)	220 (100.0)	
Age									
<40	21 (5.8)	15 (9.4)		9 (3.8)	4 (6.8)		30 (5.0)	19 (8.7)	
40-49	59 (16.3)	23 (14.5)	0.062	40 (16.9)	13 (22.0)	0.491	99 (16.6)	36 (16.5)	0,108
50-59	122 (33.7)	38 (23.9)		70 (29.7)	18 (30.5)		192 (32.1)	56 (25.7)	
≥60	160 (44.2)	83 (52.2)		117 (49.6)	24 (40.7)		277 (46.3)	107 (49.1)	
Skin color									
White	50 (15.9)	18 (13.3)		40 (20.4)	5 (9.8)		90 (17.6)	23 (12.4)	
Brown	240 (76.4)	111 (82.2)	0.482	138 (70.4)	43 (84.3)	0.121	378 (74.1)	154 (82.8)	0.101
Black	23 (7.3)	6 (4.4)		17 (8.7)	2 (3.9)		40 (7.8)	8 (4.3)	
Other	1 (0.3)	0 (0.0)		1 (0.5)	1 (2.0)		2 (0.4)	1 (0.5)	
Marital status									
With spouse	183 (54.0)	61 (40.9)	0.008	127 (59.1)	28 (51.9)	0.337	310 (56.0)	89 (43.8)	0.003
Without spouse	156 (46.0)	88 (59.1)		88 (40.9)	26 (48.1)		244 (44.0)	114 (56.2)	
Education									
None	75 (22.9)	38 (26.6)		29 (14.9)	11 (22.0)		104 (20.0)	49 (25.4)	
Elementary school[a]	198 (60.6)	93 (65.0)	0.080	132 (68.0)	31 (62.0)	0.572	330 (63.3)	124 (64.2)	0.059
High-school[a]	45 (13.8)	8 (5.6)		25 (12.9)	5 (10.0)		70 (13.4)	13 (6.7)	
University[a]	9 (2.8)	4 (2.8)		8 (4.1)	3 (6.0)		17 (3.3)	7 (3.6)	
Cancer family history									
Yes	75 (36.4)	34 (41.0)	0.470	60 (39.7)	16 (47.1)	0.433	135 (37.8)	50 (42.7)	0.344
No	131 (63.6)	49 (59.0)		91 (60.3)	18 (52.9)		222 (62.2)	67 (57.3)	
Alcohol use									
Never	42 (15.3)	70 (58.8)		38 (19.6)	20 (46.5)		80 (17.1)	90 (55.6)	
Ex-alcoholic	115 (41.8)	20 (16.8)	<0.001	71 (36.6)	12 (27.9)	0.001	186 (39.7)	32 (19.8)	<0.001
Yes	118 (42.9)	29 (24.4)		85 (43.8)	11 (25.6)		203 (43.3)	40 (24.7)	
Tobacco use									
Never	52 (17.2)	44 (33.1)		30 (14.3)	13 (27.7)		82 (16.0)	57 (31.7)	
Ex-smoker	122 (40.4)	46 (34.6)	0.001	90 (42.9)	17 (36.2)	0.085	212 (41.4)	63 (35.0)	<0.001
Yes	128 (42.4)	43 (32.3)		90 (42.9)	17 (36.2)		218 (42.6)	60 (33.3)	

(*) Totals can vary according to missing.
Missing per variable: age (n=2; 0.2%); skin color (n=122; 14.9%); marital status (n=61; 7.5%); education (n=104; 12.7%); cancer family history (n=344; 42.1%); alcohol use (n=187; 22.9%); tobacco use (n=126; 15.4%).
(a) Complete or incomplete education.

the cases received treatment after 60 days from the diagnosis during the period investigated (Table 3).

The median time between the first visit and diagnosis was 15 days, ranging from 0 to 631 days for the cases of oral cavity and pharynx admitted by the reference institution and nearly 70% of the cases took up to 30 days to be diagnosed after the first visit. Although the median has not significantly changed according to the staging and type of first treatment, it was statistically higher (p<0.001) in the State of Amazonas (31.5 days) and well lower in the States of Pará (10 days) and Tocantins (11 days). Because of the elevated number of missing data, it was not possible to evaluate this time in the State of Acre. Among the cases submitted to surgery as first treatment, 29.0% took more than 30 days until the diagnosis and those with radiotherapy as first treatment, it was 34.1% (Table 4).

For all the data analyzed, the median time between diagnosis and beginning of treatment was 25 days, ranging from 0 to 311 days. The frequency of delays (>60 days) to begin the treatment was 32.2%. This delay was statistically higher (p=0.020) for the cases of the oral cavity (37.3%) than for the cases of pharynx (22.6%). The median time from diagnosis to beginning of the treatment ranged from 0 in Rondônia and Tocantins to 71 days in Amazonas (p<0.001), while the frequency of delays to begin the treatment varied from 4.2% in Rondônia to 59.4% in Amazonas (p<0.001). The cases who received radiotherapy as first treatment presented the highest mean time to begin the treatment (73 days) and the biggest percentage of delays (56.1%), followed by those which received chemotherapy as first treatment (median: 56 days; frequency of delay to begin the treatment: 46%).

Table 3. Distribution of the analytical cases of oral cavity and pharynx cancers of the North Region, Brazil, 2012-2015

Year	2012	2013	2014	2015	Test X²
n* (%)	199 (100.0)	229 (100.0)	140 (100.0)	250 (100.0)	p-value
Variables					
Local					
Oral cavity (C01-C06)	133 (66.8)	148 (64.6)	81 (57.9)	160 (64.0)	0.391
Pharynx (C09-C14, except C11)	66 (33.2)	81 (35.4)	59 (42.1)	90 (36.0)	
Staging					
0	0 (0.0)	2 (1.5)	0 (0.0)	3 (2.3)	
I	7 (6.4)	8 (5.8)	1 (1.6)	11 (8.5)	
II	14 (12.8)	15 (10.9)	5 (8.2)	21 (16.2)	0.498
III	21 (19.3)	29 (21.2)	12 (19.7)	22 (16.9)	
IV	67 (61.5)	83 (60.6)	43 (70.5)	73 (56.2)	
State where the hospital is					
Acre	6 (3.0)	12 (5.2)	4 (2.9)	4 (1.6)	
Amazonas	45 (22.6)	50 (21.8)	39 (27.9)	37 (14.8)	
Amapá	5 (2.5)	4 (1.7)	7 (5.0)	9 (3.6)	<0.001
Pará	83 (41.7)	92 (40.2)	22 (15.7)	96 (35.8)	
Rondônia	18 (9.0)	33 (14.4)	42 (30.0)	69 (27.6)	
Tocantins	42 (21.1)	38 (16.6)	26 (18.6)	35 (14.0)	
Time between the 1st visit and diagnosis[a]					
≤15 days	34 (43.0)	28 (46.7)	37 (56.9)	38 (57.6)	
16-30 days	15 (19.0)	13 (21.7)	12 (18.5)	11 (16.7)	0.500
>30 days	30 (38.0)	19 (31.7)	16 (24.6)	17 (25.8)	
Time between diagnosis and treatment[b]					
≤60 days	83 (49.7)	72 (40.4)	64 (56.1)	109 (49.3)	0.060
>60 days	84 (50.3)	106 (59.6)	50 (43.9)	112 (50.7)	

(*) Totals can vary according to missing.
Missing per variable: staging (n=381; 46.6%); time between the 1st visit and diagnosis (n=548; 67.0%); time between diagnosis and treatment (n=138; 16.9%).
[a] Cases referred to the hospital without diagnosis and treatment.
[b] Cases referred to the hospital without diagnosis and treatment or with diagnosis and without treatment.

Table 4. Distribution of time interval (days) between the 1st visit, the diagnosis and beginning of the treatment of oral cavity and pharynx cancer cases without diagnosis and treatment consulted at the North Region, Brazil, 2012-2015

| | Cases referred to the institution without diagnosis | | | | | | | | | Time between the diagnosis and treatment | | | | | | | |
| | Time between the 1st visit and the diagnosis | | | | | | | | | | | | | | | | |
Variables	n=270ᵃ	Mean (±SD)	Median	Min-Max	Non-parametric test p-value	≤15 days n (%)	16-30 days n (%)	>30 days n (%)	Test X² p-value	n=245ᵃ	Mean (±SD)	Median	Min-Max	Non-parametric test p-value	≤60 days n (%)	>60 days n (%)	Test X² p-value
Topography																	
Oral cavity	177	40.88 (74.6)	15	0-631	0.912**	90 (50.8)	33 (18.6)	54 (30.5)	0.990*	161	52.1 (62)	36	0-311	0.135**	101 (62.7)	101 (62.7)	0.020*
Pharynx	93	37.1 (58.1)	14	0-356		47 (50.5)	18 (19.4)	28 (30.1)		84	33 (40.2)	18	0-182		65 (77.4)	65 (77.4)	
Staging																	
0 and I	9	32 (51)	2	0-143	0.727***	5 (55.6)	2 (22.2)	2 (22.2)	0.999*	8	10 (28.3)	0	0-80	0.126***	7 (87.5)	7 (87.5)	0.641*
II and III	38	30.6 (47.6)	13	0-193		22 (57.9)	7 (18.4)	9 (23.7)		35	33.5 (48.6)	1	0-163		25 (71.4)	25 (71.4)	
IV	79	26.4 (47.6)	12	0-356		46 (58.2)	15 (19.0)	18 (22.8)		75	33.4 (45.8)	16	0-209		56 (74.7)	56 (74.7)	
Stateᵇ																	
Acre	2	31.5 (34.6)	31.5	7-56	<0.001***	1 (50)	0 (0.0)	1 (50)	<0.001*	2	59 (36.8)	59	33-85	<0.001***	1 (50.0)	1 (50.0)	<0.001*
Amazonas	84	65.8 (79)	31.5	1-395		25 (29.8)	15 (17.9)	44 (52.4)		69	81.1 (54.2)	71	1-248		28 (40.6)	28 (40.6)	
Amapá	24	14.46 (13.1)	12	0-47		13 (54.2)	8 (33.3)	3 (12.5)		19	30.3 (37.5)	22	0-127		16 (84.2)	16 (84.2)	
Pará	59	38.5 (89.9)	10	0-631		34 (57.6)	9 (15.3)	16 (27.1)		54	65.5 (67.9)	49	0-311		30 (55.6)	30 (55.6)	
Rondônia	24	28.3 (58.4)	14	0-292		15 (62.5)	5 (20.8)	4 (16.7)		24	9.13 (22.8)	0	0-109		23 (95.8)	23 (95.8)	
Tocantins	77	23.4 (40.2)	11	0-229		49 (63.6)	14 (18.2)	14 (18.2)		77	14.6 (29.8)	0	0-108		68 (88.3)	68 (88.3)	
1st treatment																	
None	3	82 (54.7)	72	33-141	0.088***	0 (0.0)	0 (0.0)	3 (100)	0.002*	–	–	–	–	<0.001***	–	–	<0.001*
Surgery	145	35.3 (53.1)	18	0-395		66 (45.5)	37 (25.5)	42 (29)		123	30.7 (47.4)	2	0-210		98 (79.7)	98 (79.7)	
Radiotherapy	41	61.0 (123.7)	11	0-631		26 (63.4)	1 (2.4)	14 (34.1)		41	78 (69.8)	73	0-311		18 (43.9)	18 (43.9)	
Chemotherapy	63	37.2 (50.4)	17	0-225		31 (49.2)	11 (17.5)	21 (33.3)		63	63.5 (52.6)	56	0-248		34 (54.0)	34 (54.0)	
Other	18	26.4 (67.5)	9	0-292		14 (77.8)	2 (11.1)	2 (11.1)		18	10.4 (29.6)	0	0-114		16 (88.9)	16 (88.9)	
Total	270	39.6 (69.2)	15	0-631		137 (50.7)	51 (18.9)	82 (30.4)		245	45.6 (56.1)	25	0-311		166 (67.8)	166 (67.8)	

(*) Chi-square test.
Mann-Whitney U tests.
(***) Kruskal-Wallis test.
(ᵃ) Totals can vary according to missing.
Missing per variable of time analysis between the first visit and the diagnosis: staging (n=144; 53.3%).
Missing per variable of time analysis between the diagnosis and treatment: staging (n=127; 51,8%).
(ᵇ) Except Roraima which did not report any case.

For the cases of oral cavity and pharynx cancers who were referred to reference centers with diagnosis and without treatment, the median time between diagnosis and beginning of treatment was 77 days, ranging from one to 1,841 days while the frequency of delay (>60 days) to begin the treatment was 62.8%. The median time to begin the treatment was statistically bigger (p<0.001) for oral cavity cases (91.5 days) than for pharynx (63 days), just like the frequency of delays (p=0.002) for oral cavity (68.2%) than pharynx (53.4%). The frequency of delays did not vary significantly (p=0.361) according to staging (Table 5).

The median time to begin the treatment ranged from 43 days in Acre to 117 days in Pará with frequency of delays to begin the treatment (>60 days) ranging from 35.2% in Roraima to 78.5% in Pará. The cases submitted to surgery as first treatment had greater median time to begin the treatment (112 days) when compared to radiotherapy (88 days), to chemotherapy (79 days) and to other treatments (35 days). However, the greatest frequency of delays was found for the cases who received radiotherapy as first treatment (71.5%) with statistical significance (p<0.001) according to Table 5.

DISCUSSION

It was found high proportion of oral cavity and pharynx lesions in males corroborating the international[20-22] and national[23,24] scientific literature. For the age-range of older than 40 years, the frequencies of cases of oral cavity and pharynx were quite similar for men and women alike than in the age range lower than 40 years. More than 50%

Table 5. Distribution of the time interval (days) between diagnosis and beginning of treatment of oral cavity and pharynx cancers referred to the institution with diagnosis and not in treatment at the North Region, Brazil, 2012-2015

Variables	Cases referred to the institution with diagnosis and not in treatment							
	Time between diagnosis and treatment							
	n=435[a]	Mean (±SD)	Median	Min.-Max.	Non-parametric test	≤60 days	>60 days	Test X²
					p-value	n (%)	n (%)	p-value
Topography								
Oral cavity	274	127.4 (110.1)	91.5	1-699	<0.001**	87 (31.8)	187 (68.2)	0.002*
Pharynx	161	98.9 (173.4)	63	1-1,841		75 (46.6)	86 (53.4)	
Staging								
0 and I	17	148.8 (93.5)	145	28-413	0.062***	3 (17.6)	14 (82.4)	0.361*
II and III	85	133.5 (116.5)	103	11-699		25 (29.4)	60 (70.6)	
IV	145	120.9 (169)	81	1-1,841		49 (33.8)	96 (66.2)	
State[b]								
Acre	22	66.3 (63.1)	43	12-273	<0.001***	14 (63.6)	8 (36.4)	<0.001
Amazonas	84	119.1 (99.2)	91	15-582		25 (29.8)	59 (70.2)	
Amapá	1	–	–	–		1 (100.0)	0 (0.0)	
Pará	195	153.5 (175.2)	117	7-1,841		42 (21.5)	153 (78.5)	
Rondônia	91	69.5 (81.3)	46	1-445		59 (64.8)	32 (35.2)	
Tocantins	42	74.5 (59.6)	62	1-279		21 (50.0)	21 (50.0)	
1st treatment								
Surgery	104	137.2 (124)	112	1-699	<0.001***	35 (33.7)	69 (66.3)	<0.001
Radiotherapy	144	117.1 (98.2)	88	7-582		41 (28.5)	103 (71.5)	
Chemotherapy	118	125.2 (193.8)	79	17-1,841		39 (33.1)	79 (66.9)	
Other	69	71.7 (98.2)	35	1-517		47 (68.1)	22 (31.9)	
Total	435	116.8 (137.5)	77	1-1,841		162 (37.2)	273 (62.8)	

(*) Chi-square test.
(**) Test U of Mann-Whitney.
(***) Test of Kruskal-Wallis.
(a) Total may vary according to missing.
Missing per variable: staging (n=188; 43.2%).
(b) Except Roraima which did not present any case.

of the cases of these cancers were detected for men and women older than 50 years[20-22,24].

Although most of the national and international studies found high frequency of these cancers in White men and women[14,20,24,25], the present results showed that these cases were more frequent in Brown individuals, men and women, partially explained by the miscegenation at the North Region, in addition to identity policies and more acceptance of self-claimed skin color in Brazil[26].

Most of the cancers investigated were detected in men living with their spouses in contrast to women who lived without spouse, possibly justified by the expressive number of widows of the sample[27]. In Barretos (State of São Paulo), 2.7 more widows were found in comparison to widowers[25].

According to the International Agency for Research on Cancer (IARC)[2], tobacco and alcohol use are the main risk factors for oral cavity and pharynx cancers since their carcinogenic effects are attributed to the potential of exposing the mucosa to the penetration of alcohol and tobacco-related carcinogens[28].

The data of the Health National Inquiry (PNS) of 2013[29] showed that 43.3% of the oral cavity and pharynx cancer were detected in males alcohol-users at the North Region and 24.7% in women. The same sources found that 19.2% of men and 8.0% of women aged 18 years or older of the same region were tobacco users.

Although the importance of these risk factors for oral cancer is recognized[30], investigations of charts showed high proportion of missing information, in general, tobacco and alcohol are classified as optional, possibly leading health professionals to fail to fill in these information[9,30].

It was found from the current investigation a median time of 15 days between the first consultation and diagnosis of cases admitted without diagnosis and without treatment, ranging from 0 and 631 days, corroborating two other studies conducted in Brazil which identified similar median times, both in the State of Alagoas (medians of 17 and 14 days for each study)[9,31]. The studies performed in Europe showed median times above the present study: 18 days (1-384) in Denmark[32] and 22 days (4-134) in United Kingdom[33].

Amazonas presented the worst results of the time between the first consultation and the diagnosis with median of 31.5 days and more than 50% of these cases diagnosed after 30 days from the first consultation. It suggests the existence of barriers in the flow of patients to submit to the procedures. Although these results can be explained by the fact that when the study was carried out, the State, the second in population in the North Region had two institutions only – a High Complexity Oncology Care Center (Cacon) and one High Complexity Oncology Unit (Unacon).

During the study period, the interval between the first consultation and the diagnosis was still uncovered by law, but in 2019, Law 13,896 dated October 30 was approved[34], determining 30-days to diagnose malignant neoplasm which entered into force in 2020.

The unprecedent nature of the study is one of its benefits because it evaluates cases of oral cavity and pharynx cancer in all the States of the North Region, presenting a clinical-epidemiological profile and information about the time to take the necessary actions for treatment in the Region as a whole. Future studies are necessary to check the adequacy of the time spent by Cacon/Unacon to diagnose cases without diagnosis and treatment. The main limitation is about the source of information possible missing data.

CONCLUSION

The conclusion based in the results of the present study indicate that the clinical-epidemiological profile of the cases of oral cavity and pharynx of the North Region is similar to the profile of the cases consulted in other regions of the country and in the world, dissimilar only for Brown skin color which was more frequent. It was attempted to, in addition to characterize the profile, contribute to the knowledge about this region, becoming a source of information to plan public health actions and future interventions associated with prevention, screening and treatment of these neoplasms.

CONTRIBUTIONS

All the authors contributed substantially to the study design, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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