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Mortality from oral cancer in Aracaju/SE, Brazil: 2000-2009

Mortalidade por câncer de boca em Aracaju/SE, Brasil: 2000-2009

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Resumo

Introdução: A incidência do câncer de boca varia amplamente no mundo, sendo que dois terços dos casos têm sido diagnosticados em países em desenvolvimento. **Objetivo**: Investigar a epidemiologia dos óbitos por câncer de boca e a distribuição espacial no município de Aracaju, estado de Sergipe, entre 2000 e 2009. **Material e método**: Os dados foram coletados do Sistema de Informação de Mortalidade (SIM) de Aracaju/SE e no site do DATASUS e foram tabulados através do Tabwin 3.4. Foi realizada a distribuição geográfica dos óbitos por bairros desta cidade. **Resultado**: Dos 78 óbitos, 61 (78,2%) eram do sexo masculino. A média de idade foi 64,23 anos. A maior frequência de óbitos foi em indivíduos de cor parda (34,6%). Quanto à escolaridade, a maioria das declarações de óbito registrou a opção ignorada, seguida de indivíduos com 1 a 3 anos de estudo. Os sítios anatômicos mais acometidos foram partes não especificadas da boca (43,6%). A análise da distribuição espacial mostrou que os bairros Santos Dumont, Luzia, Atalaia, Santa Maria, Cidade Nova e Industrial apresentaram as maiores frequências de óbito. **Conclusão**: O perfil epidemiológico delineado foi de indivíduos do sexo masculino, entre a quinta e sexta décadas de vida, de cor parda, baixa escolaridade e nos bairros com baixa ou muito baixa condição de vida.

Descritores: Mortalidade; neoplasias bucais, perfil de saúde.

Abstract

Introduction: The incidence of oral cancer varies widely in the world, with two thirds of cases diagnosed in developing countries. **Objective**: To investigate the epidemiology of deaths from oral cancer and the spatial distribution in the city of Aracaju in the state of Sergipe between 2000 and 2009. **Material and method**: Data were collected using the Mortality Information System (MIS) of Aracaju/SE at the DATASUS website and were tabulated using the software TABWIN 3.4. The geographic distribution of deaths by neighborhoods of that city was visualized. **Result**: Of the 78 deaths, 61 (78.2%) were male. The mean age was 64.23 years. Individuals of mixed ethnicity had a higher death frequency (34.6%). Regarding education, the majority of death certificates recorded the option ignored, followed by individuals with 1 to 3 years of study. The anatomical sites most affected were unspecified parts of the mouth (43.6%). The spatial distribution analysis indicated that neighborhoods such as Santos Dumont, Luzia, Atalaia, Santa Maria, Cidade Nova and Industrial had the highest death frequencies. **Conclusion**: Males between the fifth and sixth decades of life of mixed ethnicity, low education and in neighborhoods with low and very low standards of living constitute the epidemiological profile for deaths from oral cancer.

Descriptors: Mortality; mouth neoplasms; health profile.

INTRODUCTION

Oral cancer affects the lips and oral cavity (gums, buccal or cheek mucosa, hard palate, tongue and floor of the mouth). In many countries, this disease has been considered a major public health problem due to its prevalence, morbidity and socioeconomic impact consequent to its complications[1].

In addition to the role genetic factors play in carcinogenesis, several factors are considered to be predisposing to the onset of cancer in general. Among these factors, it is possible to highlight environmental factors, such as water, soil and exposure to solar radiation; occupational factors; and sociocultural factors, including food, drugs, lifestyle and habits. Furthermore, alcohol abuse, smoking habits and human papillomavirus infection (HPV) are factors that potentiate the genesis of malignant tumors[2-4].

According to the World Health Organization (WHO), oral cancer is responsible for 267,000 new cancer cases, of which

approximately two-thirds originate from developing countries[1,5,6]. In these countries, oral cancer is the third most common type of cancer, second only to cervical and stomach cancer[7]. Approximately 128,000 deaths from mouth cancer occur annually worldwide[5], representing 2-5% of all malignant neoplasms[8].

In Brazil, the incidence of oral cancer was estimated in 2008-2009 biennium places; this pathology was the seventh most common malignancy, with 14,160 new cases. In the same period, the country recorded 5,651 deaths, with the highest frequencies observed in males aged over 40 years and with low education and income[9].

The distribution of death from oral cancer in Brazil is unequal in the five regions[9], making it important to conduct epidemiological studies to ascertain the actual situation of each locality. Furthermore, a better knowledge of the spatial distribution can improve the action planning for local health authorities.

The aim of this study was to investigate the epidemiological profile of deaths from mouth cancer and their spatial distribution in the city of Aracaju, Sergipe, Brazil, between 2000 and 2009.

MATERIAL AND METHOD

This is a retrospective study with a quantitative approach, based on the analysis of secondary data from the Mortality Information System (MIS), regarding all deaths from cancer of the mouth in the city of Aracaju from 2000 to 2009.

Aracaju, the capital of Sergipe State, is located on the coast (geographic coordinates 10° 54' 40" S and 37° 04' 18" W) 4 m above sea level and has an area of 181.8 km^2. In 2010, the municipality had 571,149 inhabitants, with a density of 3140.67 hab/km^2, distributed in 39 neighborhoods.

Data were obtained from MIS at DATASUS and the Municipal Secretary of Aracaju using the software Tabwin 3.4. The variables analyzed were sex, age, race, education, cancer location, occupation and district. The variable occupation, available in the municipal database, was registered from 2006.

The anatomic location of the cancer was described according to the International Classification of Diseases (ICD-10) in accordance with Chapter II[10]. For anatomical reasons, this study includes only the following codes: C00 - Malignant neoplasm of the lip; C01 - Malignant neoplasm of the base of the tongue; C02 - Malignant neoplasm of other and unspecified parts of the tongue; C03 - Malignant neoplasm of the gums; C04 - malignant neoplasm of the floor of the mouth; C05 - malignant neoplasm of the palate; C06 - malignant neoplasm of other parts and unspecified parts of the mouth.

Descriptive data analysis was performed using the calculation of absolute frequencies and percentages for categorical variables. To calculate the mortality rate, relative risk (RR) and odds ratio (OR), censuses conducted in 2000 and 2010 (Brazilian Institute of Geographic and Statistics - IBGE), the population count conducted in 1996 and the population estimates for additional years were used[11]. To compare differences between proportions, a chi-square distribution (χ^2) with a significance level of 5% ($p < 0.05$) was used.

The Center for GIS from the Municipal Planning Department provided a georeferenced Aracaju map. The thematic map elaboration with the spatial distribution of deaths per neighborhood was performed using map software.

The Ethics and Research Committee from Tiradentes University approved this study, which complied with all of the provisions of Resolution 196/96 of the National Council on Ethics in Research (CONEP).

RESULTS

From 2000 to 2009, 78 cases of death from mouth cancer were registered in Aracaju, Sergipe. Of them, 61 (78.2%) deaths occurred in males, and 17 (21.8%) deaths occurred in females. The mean age was 64.23 years (±13.28). There was no record of death in individuals younger than 30 years. The deaths predominantly occurred in the age groups of 50-60 and 60-70 years, with 22 (28.2%) cases each. The age group of 30-40 years had the lowest percentage of occurrence. As for race, 27 (34.6%) were classified as mixed ethnicity, 25 (32.1%) were white and the classification was ignored in 20 (25.6%) cases.

Regarding education, the ignored record had the highest frequency, with 27 (34.6%) cases. Moreover, among those with this record, the highest frequencies of deaths occurred among individuals with the lowest numbers of years of study. More deaths occurred in the hospital environment (Table 1).

Considering the individuals' occupations, of 30 deaths, 6 (20%) had an ignored record. Among those who had specified their occupation, 5 (16.7%) cases were classified as retirees/pensioners and 3 (10%) cases were bricklayers.

The distribution of deaths according to anatomical site (ICD-10) is presented in Table 2. The findings indicate that malignant neoplasms of other parts and unspecified parts of the mouth (ICD-C06) and malignant neoplasms of other parts and unspecified parts of the tongue (ICD-C02) appear with greater frequency, with 34 (43.6%) and 26 (33.3%) cases reported, respectively. The ICD code C03, which defines malignant neoplasms of the gums, had no occurrences.

There were no significant associations between the anatomical location of the lesion and the variables gender, age, race and education (data not shown).

The population of the city of Aracaju grew from 461,534 inhabitants in 2000 to 544,039 inhabitants in 2009. The overall mortality rate for oral cancer had higher values in the years 2003 and 2004: 2.50 and 2.47 per 100,000 inhabitants, respectively. The lowest overall mortality rate (0.39/100,000 inhabitants) was observed in 2006. Males had the highest mortality rates in all of the years evaluated. Regarding females, in 2003, that rate reached its highest discrepancy, with 4.46 deaths per 100,000 in the population (Table 3).

In all years studied, males had a higher chance of death from mouth cancer. The slightest chance of death was present in 2006,

Table 1. Distribution of sociodemographic characteristics of cases of death from oral cancer in the city of Aracaju/SE in the period from 2000 to 2009

Variables	n	%	p[a]
Gender			
Males	61	78.2	p< 0.0001
Females	17	21.8	
Age group (years)			
30-40	2	2.6	p = 0.000
40-50	8	10.3	
50-60	22	28.2	
60-70	22	28.2	
70-80	10	12.8	
≥80	14	17.9	
Race			
White	25	32.1	p = 0.003
Mixed	27	34.6	
Black	6	7.7	
Ignored	20	25.6	
Schooling			
None	6	7.7	p < 0.0001
1 to 3 years	19	24.4	
4 to 7 years	16	20.5	
8 to 11 years	5	6.4	
12 years or more	5	6.4	
Ignored	27	34.6	
Place of death			
Hospital	48	61.5	p< 0.0001
Residence	29	37.2	
Other	1	1.3	

[a] Chi-square (χ^2).

Table 2. Distribution of deaths from oral cancer in terms of anatomic location (ICD-10) in the city of Aracaju/SE in the period from 2000 to 2009

ICD -10	n	%
C00 – Malignant neoplasm of the lip	2	2.6
C01 – Malignant neoplasm of the base of the tongue	7	9.0
C02 – Malignant neoplasm of other and unspecified parts of the tongue	26	33.3
C04 – Malignant neoplasm of the floor of the mouth	2	2.6
C05 – Malignant neoplasm of the palate	7	9.0
C06 – Malignant neoplasm of other parts and unspecified parts of the mouth	34	43.6

$\chi^2 = 71.077$; $p < 0.0001$.

with an RR of 1.06 (95% CI 0.26 to 4.27) and an OR of 1.13 (95% CI 0.07 to 18.2); in 2009, the chance of death was observed to be higher, with an RR of 1.97 (95% CI 1.66 to 2.33) and an OR of 12.65 (95% CI 1.63 to 98.0) (Table 3).

Of the 39 neighborhoods, there were death records in 34 (87.2%). The neighborhood of Santos Dumont had a higher frequency with 7 (9.2%) deaths, followed by the neighborhoods Luzia and Atalaia, both with 5 (6.5%) cases, and Cidade Nova, Industrial and Santa Maria, with 4 (5.2%) cases each (Figure 1).

DISCUSSION

The full and correct completion of the death certificate is a basic factor for accuracy in the observation of epidemiological data on mortality. In Brazil, few studies have evaluated specific encodings of a specific neoplasm such as oral cancer, which is a clinically important condition, despite its inclusion in few studies that can be evaluated comparatively[12].

Sociocultural factors associated with increased exposure to carcinogens have been identified as the main reason for the higher incidence of oral cancer among men[13-16]. Several studies[12,13,17-19] have shown that the highest mortality rates for this cancer are found in males, with male:female proportions ranging from 1.5:1 to 5.4:1. In this study, the male population also had the highest rate of death, with a proportion of 3.6:1.

There is evidence that women more easily perceive the disease symptoms relative to men; women also look more intensely for solutions within or outside conventional medicine, a behavior that serves to prolong female life.

A study identified an increasing trend in mortality from oral cancer in both sexes; however, the study identified higher incidences and mortality in groups of lower social status, as measured by education, occupation and income indicators[20]. The overall trend of an increase in mortality records has focused on men aged 60 or older, a group that would be more substantially affected by the cumulative time of exposure to risk factors[21].

In this study, there were no deaths from oral cancer in individuals aged less than 30 years, and the 50-60 years age group was the most affected, in accordance with other findings in the literature[14,15,17,19,22]. According to U.S. National Cancer Institute Surveillance, Epidemiology and End Results (SEER) program, the average age of oral cancer diagnosis is 65 years[23]. The National Cancer Institute (INCA)[9] classifies men from the age of 40 as a high-risk group, indicating the slow evolution and chronicity of the pathology, which influences the morbimortality profile. Accordingly, the adoption of programs and measures against the consumption of carcinogens such as alcohol and tobacco is associated with lesion prevention and early detection and may eventually reduce deaths in the population[20,24,25].

In Aracaju, preventive and detective actions against oral cancer are routinely performed by the Oral Health staff of the

Table 3. Distribution of the mortality rate from oral cancer per 100,000 in the population, relative risk and odds ratio in Aracaju, from 2000 to 2009

Year	General population	General deaths	General MC	Male population	Male death	Male MC
2000	461534	3	0.65	215887	2	0.93
2001	468296	9	1.92	219047	5	2.28
2002	473990	6	1.27	221715	5	2.26
2003	479767	12	2.50	224413	10	4.46
2004	485531	12	2.47	227111	9	3.96
2005	498618	4	0.80	233230	3	1.29
2006	505287	2	0.40	236349	1	0.42
2007	511891	10	1.95	238375	9	3.78
2008	536785	8	1.49	249776	6	2.40
2009	544039	12	2.21	252955	11	4.35

Year	Female population	Female deaths	Female MC	RR M/F (95% CI)	OR M/F (95% CI)
2000	245647	1	0.41	1.42 (0.64-3.17)	2.27 (0.20-25.0)
2001	249249	4	1.60	1.18 (0.66-2.13)	1.42 (0.38-5.29)
2002	252275	1	0.40	1.78 (1.24-2.54)	5.68 (0.66-48.6)
2003	255354	2	0.78	1.78 (1.38-2.29)	5.68 (1.24-25.9)
2004	258420	3	1.16	1.60 (1.15-2.22)	3.41 (0.92-12.6)
2005	265388	1	0.38	1.60 (0.90-2.82)	3.41 (0.35-32.8)
2006	268938	1	0.37	1.06 (0.26-4.27)	1.13 (0.07-18.2)
2007	273516	1	0.37	1.93 (1.57-2.40)	10.3 (1.30-81.2)
2008	287009	2	0.70	1.61 (1.08-2.40)	3.44 (0.69-17.0)
2009	291084	1	0.34	1.97 (1.66-2.33)	12.6 (1.63-98.0)

MC = Mortality Coefficient. RR = Relative Risk. OR = Odds Ratio. 95% CI = 95% Confidence Interval.

Family Health Units. In addition to individual consultations, collective activities are conducted, including outreach through home visits and visits to schools, shelters and support homes. When suspicious lesions are detected, the patient is referred to health institutions that provide specialized assistance, such as the Center for Dental Specialties (CEO) and the University Hospital / UFS. In 2008, an annual campaign that always occurs in the third week of October was initiated. In 2010, a municipal law (n° 3674/2010) established an Oral Cancer Prevention Week in Aracaju.

According to Honorato et al.[26] (2009), greater emphasis should be placed on the awareness of the population at risk and the training of professionals for the early recognition of the disease, as late diagnosis negatively affects overall patient survival.

The deaths in this study occurred more frequently in mixed ethnicities individuals. This finding may be associated with the ethnic composition of the region, whose miscegenation has been present throughout the centuries, a fact that also hinders the establishment of specific categories that define this variable.

The variable education resulted in low completeness rates for death certificates; however, a predominance of death in individuals with low education was observed. This finding corroborates other studies[14,15] and indicates an inverse relationship between the level of education and oral cancer, which is justified by the fact that this population has very precarious access to health information.

There is evidence that professional activity can be considered a risk factor for the onset and progression of oral cancer[27]. However, in this study, it was not possible to determine the individuals' occupations because most death certificate records were poorly defined. This demonstrates the accuracy of the information in this variable, which can be credited to the low priority given to completing the declaration, despite its importance to the disease epidemiology in the local context[12].

Regarding the anatomical location, the highest rates identified were related to unspecified parts of the mouth and unspecified parts of the tongue. In a study evaluating mortality trends for oral and oropharyngeal cancer in São Paulo, tongue cancer represented the highest concentration of deaths. Cancer

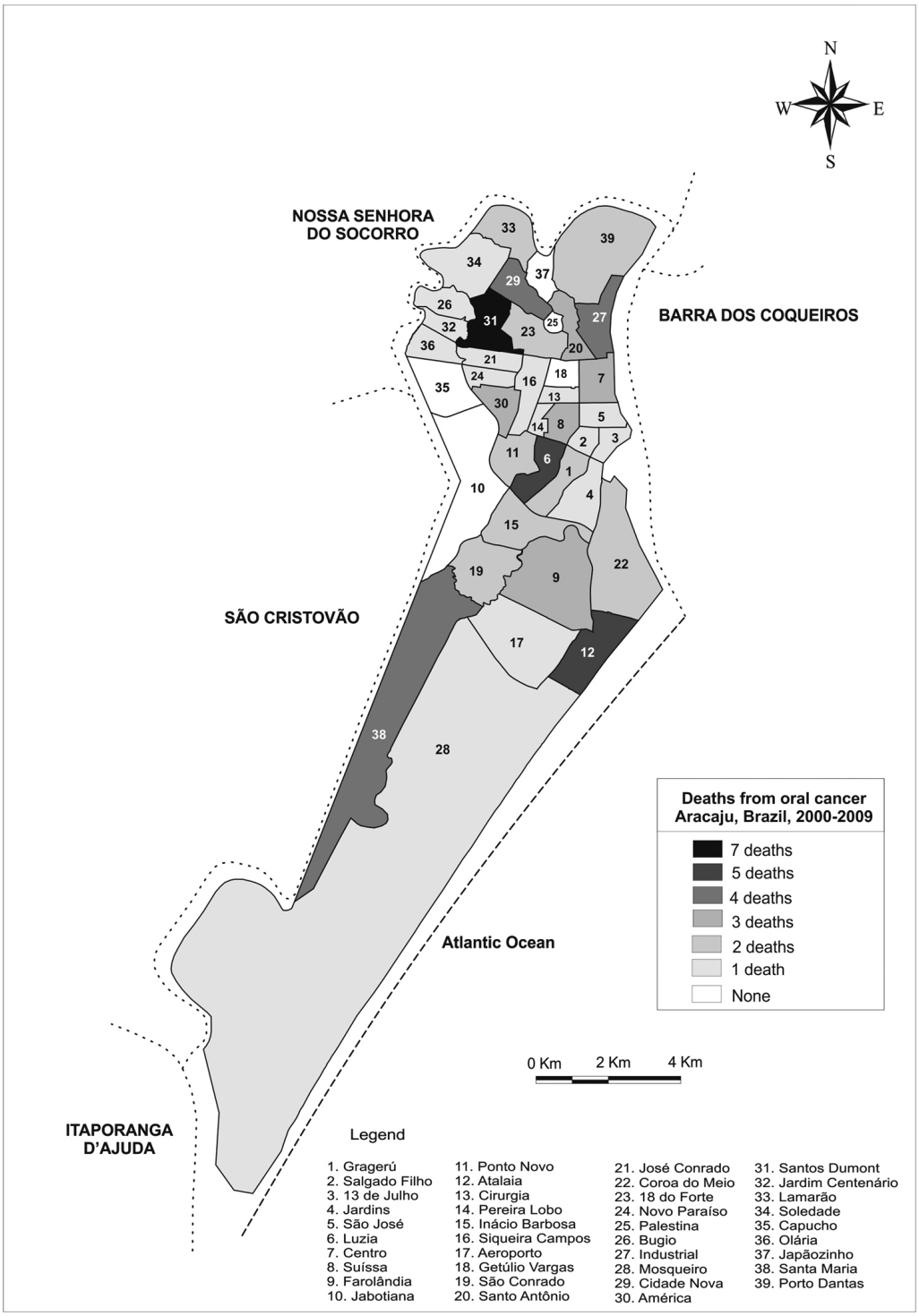

Figure 1. Spatial distribution of deaths from oral cancer in Aracaju/SE second neighborhoods, from 2000 to 2009.

of other parts and unspecified parts of the mouth also accounted for high percentages of mortality[21]. Research conducted in Australia revealed that over 50% of cases were lip cancer[18], which differs from the results of this study, in which tongue cancer cases prevailed. There were no significant associations between the anatomical location of oral cancer that led to death and the variables gender, age, race and education.

The evolution of population growth in the years studied shows that the population generally grew 17.88%). This growth was due to vegetative and migratory mechanisms, such as job offers, economic growth and improvement in the delivery of services.

Spatial analysis of health events through the use of georeferenced maps is an important tool for assessing public health risks, particularly when this type of analysis associates the socioeconomic aspects of the population with its environment[28]. The visualization of information enables a better understanding of how relationships occur and can contribute to better action planning.

Historical factors of occupation, low per capita income per inhabitant and education level have been identified as factors associated with both the occurrence of oral cancer and the death outcome[29]. In this study, the Living Conditions Index of

the districts was analyzed, taking indicators of the 2010 IBGE census as parameters, including the proportion of houses whose householder is illiterate and has a monthly income per capita of up to ¼ minimum salary[30]. It was observed that among the six neighborhoods with the highest death frequencies, only the Luzia neighborhood was rated as being of high social status; the others were classified as low or too low.

In summary, the epidemiological profile defined for deaths from oral cancer included males between the fifth and sixth decades of life who were of mixed ethnicity and had low education. Most of the deaths occurred in the hospital environment, and the most prevalent anatomical sites of oral cancer were unspecified parts of the mouth and tongue. The spatial distribution per district indicated that deaths occurred mostly in neighborhoods with low or very low living conditions.

The ongoing necessity for investment is clear, especially in actions for the control of oral cancer, performance levels that encompass health promotion, early disease detection, human resources training, care, supervision, communication and social mobilization and research and management of the Unified Health System (Sistema Único de Saúde - SUS).

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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