

EPIDEMIOLOGIC ASPECTS OF MORTALITY FROM ORAL CANCER: UNDERSTANDING THE RISKS TO ENABLE THE EARLY DETECTION OF CHANGES IN COMMUNICATION

Aspectos epidemiológicos da mortalidade por câncer de boca: conhecendo os riscos para possibilitar a detecção precoce das alterações na comunicação

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ABSTRACT

Purpose: to characterize the epidemiology of oral cancer mortality in the city of Olinda, in the period from 2008 to 2012. **Methods:** an epidemiological study, population-based, sectional-type, was conducted using data from the Mortality Information System of deaths from oral cancer in the period from 2008 to 2012 in residents of Olinda. The Specific Mortality Coefficient for oral cancer was calculated, and it were analyzed the variables gender, age group, race / skin color, education level, marital status, occupation, anatomic site of cancer and death occurrence location, and the percentage differences were tested using the Yates corrected Chi-square ($\alpha = 5\%$). Prevalence ratio was measured ($\alpha = 5\%$). **Results:** there were 87 deaths from mouth cancer, making a Specific Mortality Coefficient 21.5 / 100,000. There were more deaths among men, unmarried, black or brown skin color, with non-manual occupation, less than 7 years of education, with anatomical location of the tumor in the pharynx and tongue ($p < 0.005$). The highest prevalence rates were found among men (PR = 3.43) in manual workers (PR = 2.86) and in cases where the cancer occurred in the palate (OR = 4.5). **Conclusion:** the identification of epidemiological aspects that present the greatest risk for mortality from oral cancer will guide the planning of health interventions and Speech Therapy.

KEYWORDS: Mouth Neoplasms; Mortality Registries; Stomatognathic System

■ INTRODUCTION

Cancer is recognized as a public health issue in Brazil, particularly due to two aspects: firstly, the increase in registered cases and mortality, proportional to demographic growth, population aging and socioeconomic development. Secondly, the challenge that it represents to the health system to guarantee effective and equal access of the people to diagnosis and treatment of the disease ¹.

Among the most frequent types of cancer in the world, head and neck cancer are on sixth place, representing about 3% of every neoplasms. Of these, 40% occur on the mouth, 25% on the larynx, 15% on the pharynx and 20% on other anatomic sites, including salivary glands ². On 2012, 300.000 new cases of mouth cancer occurred and 145.000 died because of it ³.

It is considered mouth cancer the one located in the oral cavity, including oropharynx, and in all the structures inside it. It is the sixth most frequent case in Brazil and the fourth in Northeast region ^{2,4}, being considered the most common head and neck cancer when excluded the non-melanoma skin cancer. In 2014, there was an estimated amount of 15.290 new cases of mouth cancer in Brazil, being

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11.280 in men and 4.010 in women. These values correspond to an estimated risk of 11,54 new cases for every 100.000 men and 3,92 for every 100.000 women^{3,5}.

Mouth cancer is recognized as the most serious disease to affect the mouth, causing 4.891 deaths in 2010, 3.882 men and 1.009 women, placed third on the rank of lethality by neoplasms^{2,6}. The death rates by mouth cancer on males have presented a decrease in most countries, but such values are still high in Brazil³.

Despite the seriousness of the disease, the early detection through clinical exams on mouth tissues can discover potentially malignant abnormalities that, when discovered in early stages, enables a less aggressive treatment and a better prognosis³.

In Brazil, the tongue is the structure with most occurrence of mouth cancer, with 32% of cases, followed by the oropharynx (18,5%) and the floor of the mouth (12,4%). Epidermoid carcinoma is the most frequent tissue type⁷.

Nowadays, cancer is the third major death cause in Brazil, behind heart conditions and external causes. When considering individuals older than 40 years, cancer becomes the second major death cause, preceded only by heart conditions^{8,9}. The death rates represent the main indicator of a society's health status. In general, malignant neoplasms represent an important cause of morbidity and mortality among chronic and degenerative diseases, stimulating scientific production and, with that, the development of specific actions for the control of these conditions by health services^{6,7}.

Therefore, this paper aims to characterize the epidemiological aspects of death by mouth cancer in the city of Olinda, for the period from 2008 to 2012.

■ METHODS

This is an epidemiological study, population-based, sectional, developed in the city of Olinda. Olinda is located in the Metropolitan Region of Recife, in the State of Pernambuco, with 379.271 inhabitants. The city presented, in 2010, an average house income of 621,73 reais, and 39,33% of the population received an average of ½ a minimal wage, with an unemployment rate of 13,01% and an illiteracy rate of 6,5%^{10,11}.

This research was approved by the Ethics Committee in Research of the Higher Education Foundation of Olinda (Funeso), under the CAAE number 21394913.9.0000.5194 and report number 420.224/2013.

The population of this study was formed by the universe of deaths which had mouth cancer (CID

C00 to C14) as basic death cause, on the period from 2008 to 2012, residents in Olinda.

The data was extracted from the Mortality Information System (SIM), with the consent of the city's Secretary of Health. The period was analyzed in an aggregated form to control the random fluctuations due to the small numbers, according to research strategy already validated by other authors¹²⁻¹⁶.

Many variables were analyzed, such as social (gender, age, race/skin color, instruction level, marital status and occupation), clinical (anatomic site of the cancer) and of access to health services (place of death and its relation to the Unified Health System – SUS). They were described through absolute and relative frequencies and had the percentage difference tested by Yates' chi-squared test, with $\alpha = 5\%$.

The specific coefficient of mortality by death cause was calculated, age-adjusted, using the method of direct standardization, taking Brazil's population as standard. This standardization was used as a way to control possible interferences of population distribution in the city.

Lately, the mortality coefficients for mouth cancer were calculated for the variables gender, age, instruction level, occupation, marital status, race/skin color and frequency site of the primary tumor, measuring the prevalence rate, with $\alpha = 5\%$. As exposure variables, there are: male^{7,17-22}, older than 40 years^{7,17,20-23}, white^{17,21,22}, up to seven years of study⁷, physical workers^{22,23}, married^{23,24}, tongue as most frequent site^{7,20,22}.

For the stratification of the population, according to such categories, we used data from the Brazilian Institute of Geography and Statistics (IBGE), provided by the aggregated databank from the IBGE System of Automatic Recovery (Sidra)²⁴.

The data processing and analysis were performed by Tabwin, version 3.4, and by Bioestat, version 5.0; the data was presented as a table.

■ RESULTS

On the period from 2008 to 2012, there were 87 deaths by mouth cancer in Olinda, creating a cause-specific standardized mortality ratio of 21,5/100.000 inhabitants. From the total amount, 74,7% occurred on male individuals ($p < 0,0001$), 50,57% on non-married ($p < 0,0001$), 57,47% on older than 60 years, 62,07% on black or *pardo* ($p < 0,0001$), 58,62% had a non-physical occupation ($p < 0,0001$) and 47,13% had less than seven years of study ($p < 0,0001$). It is important to stress the high level of ignorability of this last variable (37,93%).

In relation to the anatomic site of the mouth cancer, 33,33% was located in the pharynx and 31,03% on the tongue ($p < 0,0001$). 85,06% of the deaths happened in health facilities, being 83,78% of those services provided by SUS or convened to it ($p < 0,0001$).

Among the measured prevalence ratios, there is emphasis on male gender, (PR = 3,43; $p < 0,001$),

individuals who are 60 years or older (PR = 2,78; $p < 0,001$), with less than seven years of study (PR = 3,09; $p = 0,002$), married (PR = 2,10; $p = 0,001$), with physical occupations (PR = 2,86; $p < 0,001$) and with the tongue as the most frequent site (PR = 2,86 related to lip and PR = 4,5 related to palate; $p < 0,0001$; $p = 0,0002$), as shown on Table 1.

Table 1 – Epidemiological characteristics of deaths by mouth cancer on the years from 2008 to 2012, Olinda-PE

Variable	N	%	p-value	Measure of Epidemiological Association		
				PR*	p-value **	IC95%***
Gender						
Male	65	74,71	$\chi^2=21,3$	3,43	<0,001	2,12-5,57
Female	22	25.29	$p<0,0001$			
Age group						
40-59	37	42.53	$\chi^2=1,94$			
60 and more	50	57.47	$p=0,2$	2,78	<0,001	1,81-4,25
Skin color						
White	27	31.03	$\chi^2=39,9$	0		
Black or <i>pardo</i>	54	62.07	$p<0,0001$			
Not informed	6	6.90				
Level of instruction (years)						
Until 07	41	47.13	$\chi^2=14,34$	3,09	$p=0,002$	1,66-5,77
08 and more	13	14.94	$p=0,0008$			
Ignored	33	37.93				
Marital status						
Married	31	35.64	$\chi^2=17,86$	2,10	$p=0,001$	1,32-3,32
Single/widow/separated	44	50.57	$p<0,0001$			
Ignored	12	13.79				
Occupation						
Physical worker	24	27.59	$\chi^2=27,52$	2,86	$p<0,001$	1,76 – 4,65
Other occupations	51	58.62	$p<0,0001$			
Not informed	12	13.79				
Tumor site						
Lip	2	2.30	$\chi^2=35,9$	13,5	$p<0,0001$	3,21-56,77
Tongue	27	31.03	$p<0,0001$			
Palate	6	6.90		4,50	$p=0,0002$	1,86-10,90
Pharynx (oropharynx, nasopharynx, hypopharynx)	29	33.33		0		
Other parts of mouth	23	26.44		0		
Place of death occurrence						
Health facility	74	85.06	$\chi^2=42,8$	-	-	-
Domicile	13	14.94	$p<0,0001$			
Rede Própria or SUS-convened network						
Yes	62	83.78	$\chi^2=33,78$	-	-	-
No	12	16.22	$p<0,0001$			
Total	87	100,00				

(*) PR = Prevalence Rate; (**) Yates' chi-squared test with statistical significance of $p \leq 0,05$; (***) CI = Confidence Interval.

■ DISCUSSION

The results of this study allowed to characterize individuals who died because of mouth cancer, showing the most exposed population to this condition. In relation to the variable *gender*, it was seen that, throughout the studied period, there were more death on males (74,71%), presenting a prevalence ratio of death by mouth cancer of 3,43 ($p < 0,001$) times higher on men in relation to women, a factor that could be related to the lifestyle of this group, with habits such as smoking and drinking, that when combined can enhance the risk. However, studies have pointed towards growth on the prevalence of such tumors on females, particularly because of changes on the female behavior in the last decades¹⁸. The death ratio by gender for this study was 3:1, similar to other studies that depict higher proportion of death by mouth cancer among males^{7,17-19,22,25-29}. Analyzing data related to death rates according to age group, there was no statistically significant difference between the age intervals ($p = 0,2$), as found in another similar study²⁶. All deaths happened on individuals older than 40 years, with a prevalence ratio of 2,78 ($p < 0,001$) times higher among individuals who are 60 years or older, a finding also seen in other studies that highlight the occurrence of cases on individuals older than 50 years^{18,22,26-28}. There are molecular reasons, related to the mechanisms of carcinogenesis and proliferation of the tumor cell, associated to the decline of the immune system that favor the higher risk of cancer in individuals older than 60 years. With the aging of the population, it is expected a considerable increase on cancer cases among the elderly population²⁹⁻³¹.

Most cases consisted of black or *pardo* individuals (62,07%), disagreeing with other studies that had identified higher representation of morbidity among white individuals^{17,22,26,28}. Nonetheless, scientific evidence also points that black or *pardo* people, when compared to white people, tend to live farther from health services, usually due to unfavorable socioeconomic conditions, making it more difficult to have early diagnosis and specific treatment, leading to an unpleasant end for the disease^{1,32}.

The study also showed that, in the studied population, there's no difference for the death prevalence by death cancer regarding skin color ($PR = 0$). Possibly there are more people living in Northeast region in Brazil who are identified as *pardo*²⁵.

Concerning education, most deaths occurred among those with less than seven years of study (47,13%), with death by mouth cancer prevalence three times higher than with other individuals ($p = 0,002$), results similar to likewise studies^{7,26-29}.

Such aspect has also been observed in other kinds of cancer. In a research with women with breast cancer, it was detected that the survival rate of those with higher degrees of education was greater than those with less years of study³³.

Generally, there is a connection between the level of education and death by mouth cancer, showing that less favored groups tend to experience higher contact with risk factors, such as inadequate nutrition and low mouth health conditions, also presenting greater difficulty of access to health services and information about the disease. However, the results and conclusions for this variable must be interpreted cautiously, having in mind the high proportion of registries classified as *ignored* (37,93%).

About the marital status, on the sum of the years, it was found higher death rate among non-married (50,57%), something different from other studies, in which morbidity²³ and mortality by larynx cancer was more frequent among married individuals²⁵. Nevertheless, this study showed that, for mouth cancer, the death risk is higher among married people ($PR = 2,10$; $p = 0,001$). Just like level of education, marital status is a risk factor for mouth cancer occurrence. For this research, no reference could establish a direct link between the death occurrence and the individual's marital status, leading that this information is more related to life quality aspects.

Regarding occupation, most deaths occurred on people whose jobs were not related to physical labor (58,62%), but the death rate was 2,86 times higher among physical workers ($p < 0,001$). Because it is a urban, touristic and residential area, the local population is usually involved in activities related to sales, education and tourism, a difference considering other studies that found a link between mouth and pharynx cancer and other fields of work, like fishing, agriculture, painting, butchery, construction, driving, plumbing, carpet installing, and other activities that demand physical work^{7,22,26}.

It was possible to verify that most individuals presented tumor on the pharynx (33,33%), followed by the tongue (31,03%), areas more exposed to the risk factors associated to this type of cancer, like smoking, drinking and infections caused by human papillomavirus (HPV). When comparing to the death prevalence of lip and palate cancer, tongue cancer has a prevalence of 13,5 and 4,5 times higher, respectively ($p < 0,0001$; $p = 0,0002$). The tumor in these positions may favor clinical signs of the disease that reflect on speech articulation, and also difficulties on swallowing. Similar results were found on other studies, which point that smoking and drinking, when combined, raises 30 times the risk

of mouth cancer, especially on the tongue, pharynx and larynx^{3,20,22,34}.

Most registered deaths occurred inside health facilities (85,06%), a fact directly related to the malign and progressive nature of the condition, that during its evolution compromises important systems for the maintenance of vital functions, leading the individual to seek medical care; therefore, it is expected a higher amount of registered deaths in specialized facilities. Of these deaths, 83,78% happened in services provided by Brazil's Unified Health System (SUS) or convened to it. Cancer treatment is widely performed by SUS, which has reference hospitals for the attendance of the disease, from the diagnosis to the specific treatment, providing care for people of every socioeconomical classes¹.

It was also shown that 14,94% of deaths occurred in the individuals' houses, an aspect that can be justified by the fact that, in many cases of cancer, due to unviability of submitting to more aggressive treatments or not presenting healing perspective, many patients return to their houses and start palliative care, aiming to raise life quality and to have a humanized death. It is up to the attending doctor the decision of letting the patient leave the hospital; however, researches show that patients, when terminal, decide not remain in the hospital³⁵⁻³⁷. Nonetheless, this study is limited to only indicate possible explanations, for its data source was the information system and not direct interviews to health services users. There is also the possibility that the death occurred at home because of difficulty to attend to the public health system, characterizing a system flaw and not a choice by the patient and its family.

It is necessary to highlight the importance of recognition by professionals that work with oral functions of possible epidemiological aspects that expose certain groups to death by mouth cancer. The evolution to communicative loss and other

unwanted sequelae, like death, can be avoided or softened when a professional recognizes precociously neoplastic lesions and their effects. Depending on the affected areas and the reparation surgery, individuals could present organic and functional alterations, such as trouble on mobility and on the performance of orofacial structures and functions: speech articulation, voice and deglutition³⁸.

These communication alterations may be related to deterioration due treatment sequelae, being also possible a link to the adaptations developed in the attempt of overcoming limitations imposed by treatments. The tumor size and its anatomic location influence directly in the individual's communication ability, varying according to the insertion site, possibly causing hearing deterioration, facial paralysis, trismus, dysarthria, dysphagia and changes on the voice resonance^{7,28,38,39}.

■ CONCLUSION

It was verified that, on the period from 2008 to 2012, there were 87 deaths by mouth cancer in Olinda (CME 21,5/100.000), with prevalence among males (74,7%), not married (50,57%), older than 60 years (57,47%), black or *pardo* (62,07%), with nonphysical occupation (58,62%), with less than seven years of study (47,13%) and with tumor located on the pharynx (33,33%) and on the tongue (31,03%). These deaths occurred in health facilities (85,06%), 83,78% of these being services provided by SUS of convened to it.

The identification of epidemiological aspects that present most risks for death by mouth cancer will guide the planning of interventions in health and in Speech Therapy, reducing changes in oral communication and the number of deaths by this type of cancer.

RESUMO

Objetivos: caracterizar os aspectos epidemiológicos da mortalidade por câncer de boca, no município de Olinda, no período de 2008 a 2012. **Métodos:** foi realizado um estudo epidemiológico, de base populacional, do tipo seccional, a partir dos dados do Sistema de Informação de Mortalidade dos óbitos por câncer de boca no período de 2008 a 2012, em residentes de Olinda. Foi calculado o coeficiente de mortalidade específico por câncer de boca, e foram analisadas as variáveis sexo, faixa etária, raça/cor, grau de instrução, estado civil, ocupação, sítio anatômico do câncer e local de ocorrência do óbito, e as diferenças percentuais foram testadas pelo Qui-quadrado corrigido de Yates ($\alpha=5\%$). Foi mensurada a razão de prevalência ($\alpha=5\%$). **Resultados:** ocorreram 87 óbitos por câncer de boca, perfazendo um coeficiente de mortalidade específico de 21,5/ 100.000 habitantes. Houve predomínio dos óbitos entre homens, não casados, em pretos ou pardos, com ocupação não braçal, escolaridade inferior a 7 anos de estudo, com localização anatômica do tumor em faringe e língua ($p<0,005$). As maiores razões de prevalência foram encontradas entre os homens (RP=3,43), em trabalhadores braçais (RP= 2,86) e nos casos em que o câncer ocorreu no palato (RP=4,5). **Conclusão:** a identificação dos aspectos epidemiológicos que apresentam os maiores riscos para a mortalidade por câncer de boca orientará o planejamento das intervenções em saúde e em Fonoaudiologia.

DESCRITORES: Neoplasias Bucais; Registros de Mortalidade; Sistema Estomatognático

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