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Social determinants of health and death by oral cancer in a unit of high complexity in oncology of a municipality of Bahia

Determinantes sociais de saúde e óbito por câncer oral em uma unidade de alta complexidade em oncologia de um município da Bahia

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RESUMO | INTRODUÇÃO: Os determinantes sociais podem refletir na ocorrência, prognóstico e mortalidade do câncer oral. **OBJETIVO:** Analisar as principais características sociodemográficas e hábitos de vida, assim como a relação com o óbito por câncer oral em uma Unidade de Alta Complexidade em Oncologia no município de Feira de Santana, Bahia, no período de 2010 a 2016. **MÉTODOS E MATERIAIS:** Estudo transversal realizado através da revisão de prontuários clínicos, seguida de uma análise descritiva das principais variáveis e análise bivariada entre as covariáveis consideradas determinantes sociais e o óbito pela doença. Todas as análises foram realizadas com o programa SPSS 22 e Stata 14.0. **RESULTADOS:** Foram diagnosticados 282 casos de carcinomas de células escamosas, na maioria em idosos (87,6%), do sexo masculino (79,6%), de origem urbana, que residiam em municípios de grande e médio porte, negros e pardos, casados, com baixa escolaridade, com ocupação, tabagistas (89,6%) e etilistas (85,0%). As lesões estavam localizadas principalmente na região de língua (37,9%), eram moderadamente diferenciadas (48,9%), diagnosticados em estádios avançados (III e IV) (84,7%), tratados em sua maioria com quimioterapia e radioterapia (34,3%) e 35,7% dos casos foram a óbito. A variável raça/cor apresentou significância estatística com o óbito pela doença (p = 0,006). **CONCLUSÃO:** Os resultados do presente estudo revelaram que dentre as covariáveis sociodemográficas e de hábitos de vida a raça/cor apresentou significância com relação ao óbito, indicando um pior prognóstico relacionado a pacientes negros e pardos.

PALAVRAS-CHAVE: Neoplasias bucais. Carcinoma de células escamosas. Fatores socioeconômicos. Condições sociais. Epidemiologia.

ABSTRACT | INTRODUCTION: Social determinants may reflect on the occurrence, prognosis and mortality of oral cancer. **OBJECTIVE:** To analyze the main sociodemographic and life habits characteristics and the relation with death by oral cancer in a Unit of High Complexity in Oncology in the city of Feira de Santana, Bahia, from 2010 to 2016. **MATERIALS AND METHODS:** A cross-sectional study was carried out by reviewing clinical records, followed by a descriptive analysis of the main variables, and a bivariate analysis between covariables considered social determinants and death by disease. All analyzes were performed with SPSS 22 and Stata 14.0. **RESULTS:** 282 cases of squamous cell carcinomas were diagnosed, mostly in the elderly (87.6%), males (79.6%), of urban origin, living in large and medium-sized, blacks and browns, married, with low schooling, with occupation, smokers (89.6%) and alcoholics (85.0%). The lesions were located mainly in the tongue region (37.9%), moderately differentiated (48.9%), diagnosed in advanced stages (III and IV) (84.7%), mostly treated with chemotherapy and radiotherapy (34,3%) and 35.7% of the cases died. The race / color variable presented statistical significance with death from the disease (p = 0.006). **CONCLUSION:** The results of the present study revealed that, among the sociodemographic covariables and life habits, race / color showed a significant relation to death, indicating a worse prognosis related to blacks and browns patients.

KEYWORDS: Mouth neoplasms. Squamous cell carcinoma. Socioeconomic factors. Social conditions. Epidemiology.

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Introdução

Oral cancer is considered a serious public health problem worldwide, and is estimated to be the sixth most common cancer. Worldwide data show that 275,000 new cases of this neoplasm are expected per year, and two thirds of these cases occur in developing countries[1,2].

In Brazil, oral cancer is considered the twelfth most common type of cancer. According to the "Instituto Nacional do Câncer" (INCA), 11,200 new cases of the disease in men and 3,500 in women foram estimados para o biênio de 2018-2019. These values correspond to an estimated risk of 10.86 new cases per 100 thousand men and 3.28 per 100 thousand women[3].

Squamous cell carcinoma (SCC) is the most common histological type, and represents about 90% of malignant lesions in the oral cavity, of multifactorial etiology, involving environmental, lifestyle and genetic factors, with emphasis on tobacco use and alcohol consumption. The highest incidence of the disease occurs in men between the fifth and sixth decades of life, exposed to the main risk factors[2].

Socioeconomic differences reflect in many aspects a relationship with the epidemiological profile of cancer in general. Studies show that populations with low socioeconomic levels have a higher incidence of cancer in general, a higher proportion of late diagnosis, difficulty in accessing health services and, consequently, a poorer prognosis, shorter survival after diagnosis and a higher risk of death[4].

Regarding oral cancer, epidemiological studies show that most individuals affected by the disease have low socioeconomic levels[5,6]. In addition, socioeconomic conditions are related to the increase of exposure to risk factors, as socially disadvantaged groups tend to have more contact with tobacco and alcohol[7].

According to Conway et al.[8], who found through a case-control study that people living in precarious areas and unemployed individuals had a significantly higher risk of cancer than those with high levels of education. However, after adjusting the variables for smoking and alcohol consumption, the significance was lost for all measures of social class.

Socioeconomic differences are also related to prognosis, survival and mortality of patients diagnosed with oral cancer[9]. According to Dantas et al.[6], through a retrospective study conducted in Ceará, the low level of education had a significant influence on the survival of affected patients, suggesting an association between poverty and mortality from the disease.

In this sense, studies that evaluate the social determinants and this neoplasia allow the knowing of the profile of patients affected by the disease, and may support interventions and strategies for prevention, control and mortality by the disease, specifically in populations with low social status and income levels in order to improve the expectation and quality of life of the population.

Thus, this study aims to describe the main sociodemographic and lifestyle characteristics of patients with oral cancer and the relationship of these factors with oral cancer death in a Unidade de Alta Complexidade em Oncologia [High Complexity Oncology Unit] in Feira de Santana, Bahia, Brazil, from 2010 to 2016.

Methods and materials

This is an epidemiological, observational, analytical, cross-sectional study with individuals with SCC.

The study was conducted in the municipality of Feira de Santana, the second largest city in the state of Bahia/Brazil, considered one of the most important road junctions in northern and northeastern Brazil.

Data were collected at the High Complexity Unit in Oncology (UNACON), which provides oncological care to more than 72 municipalities in the Center-East macroregion, offering since 2009 chemotherapy, radiotherapy, oncologic consultation and radiotherapy services, onco-hematology and oncologic surgeries.

The population of this study was composed of all individuals with histopathological diagnosis of SCC, attended at UNACON from 2010 to 2016. Individuals diagnosed according to the World Health Organization classification were included in categories C00 to

C06 and C09 of the International Classification of Diseases for Oncology, third edition (ICD-03), (C00 lip, C01 tongue base, C02 other non-specific parts of the tongue, C03 gum, C04 floor of the mouth, C05 palate, C06 other non-specific parts of the mouth and C09 amygdala). Individuals with any other cancer, potentially malignant lesions or disorders, metastatic disease for the oral cavity or tumors of questionable malignant potential were excluded from the study.

Data were obtained through the review of clinical records of individuals included in the research and the instrument used was a specific form, pre-tested in a pilot study.

The variables in this study were related to social determinants in health (sociodemographic and lifestyle aspects), injury characteristics, treatment and patient situation of the population studied.

Initially, a descriptive analysis of the main variables in the study population was performed, in which continuous variables were expressed as mean and their standard deviation and categorical variables as relative and absolute frequencies. To verify the association between covariates and outcome of death by SCC, a bivariate analysis was performed using the chi-square test and Fisher's exact test ($p < 0.05$). All analyzes were performed using the Statistical Package for Social Sciences (SPSS) version 22.0 (SPSS Inc., ChiCad. United States) and Stata 14.0 for Windows (Statsoft Inc .; http://www.statsoft.com).

The research was approved by the Comitê de Ética em Pesquisa em Seres Humanos [Human Research Ethics Committee] of the State University of Feira de Santana (CEP/UEFS), according to opinion number 2.390.803 and CAAE: 76778417.4.0000.0053, in compliance with the norms of Resolution 466/12, of the Conselho Nacional de Saúde [National Health Council], of December 12, 2012.

Results

Between 2010 and 2016, 282 cases of SCC were diagnosed at UNACON. From this total, as shown in Table 1, 87.6% occurred in individuals older than 45 years and 12.4% in patients aged 45 and under, whose average was 59.9 years, ± 13.1.

Most of the population studied was male (79.6%), with a male: female ratio of 3.9: 1. Most of the individuals were of urban origin, residing in large and medium-sized municipalities, black and brown, married, with low education and occupation. Regarding lifestyle, most of them used tobacco (89.6%) and alcoholic beverages (85.0%) for more than 25 years, 83.2% and 82.3%, respectively (Table 1).

Table 1. Distribution of social determinants in health of patients with oral squamous cell carcinoma UNACON, Feira de Santana, BA, 2010 to 2016 (to be continued)

Variables	(n)	(%)
Age		
≤ 45 years-old	35	12.4
≥ 45 years-old	247	87.6
Gender		
Male	224	79.4
Female	58	20.6
Residence*		
Urban Area	159	75.4
Rural Area	52	24.6

Table 1. Distribution of social determinants in health of patients with oral squamous cell carcinoma UNACON, Feira de Santana, BA, 2010 to 2016 (conclusion)

Variables	(n)	(%)
Size of the municipality of origin*		
Large	148	53.6
Midsize	8	2.9
Small Size	120	43.5
Race/Color*		
White	39	19
Black and Brown	166	81
Marital Status*		
Single	114	43.0
Married/Common-law marriage	115	43.4
Divorced	9	3.4
Widower	27	10.2
Scholarity*		
Illiterate	15	55.6
Elementary School	8	29.6
High School	1	3.7
Hhigher Education	3	11.1
Occupation *		
With Occupation	141	65.6
Without Occupation	74	34.4
Tobacco		
Yes	224	89.6
No	26	10.4
Exposure Time to Tobacco*		
≥ 25 years	124	83.2
Between 15 and 24 years	21	14.1
< 15 years	4	2.7
Alcoholic Beverages *		
Yes	210	85.0
No	37	15.0
Exposure Time to Alcohol *		
≥ 25 years	95	82.3
Between 15 and 25 years	15	13.3
< 15 years	5	4.4

*Lost data

Regarding clinical and histopathological characteristics, most lesions were localized in the tongue region (37.9%), classified as moderately differentiated (48.9%) and were in advanced stages (III and IV) (84.7 %) (Table 2).

Table 2. Distribution of clinical and histopathological characteristics of patients with oral squamous cell carcinoma UNACON, Feira de Santana, BA, 2010 to 2016

Variables	(n)	(%)
Tumor Site		
Lip	29	10.3
Tongue	107	37.9
Gum	7	2.5
Floor	40	14.2
Palate	28	9.9
Other non-specific mouth parts	71	25.2
Tumor differentiation *		
Well differentiated	81	35.4
Moderately differentiated	112	48.9
Poorly differentiated	36	15.7
Staging*		
I e II	40	15.3
III e IV	222	84.7

*Lost data

Regarding treatment variables, the majority of the population had combined therapy, in which 34.3% of individuals received chemotherapy and radiotherapy and 18.2% surgery associated with chemotherapy and radiotherapy. Regarding the occurrence of deaths, 35.7% of the individuals died in the period of the present investigation and most presented the disease in progression (31%) (Table 3).

Table 3. Treatment distribution and situation of patients with oral squamous cell carcinoma UNACON, Feira de Santana, BA, 2010 to 2016

Variables	(n)	(%)
Treatment*		
Surgery	41	14.6
Radiotherapy	16	5.7
Chemotherapy	30	10.7
Surgery, Chemotherapy and Radiotherapy	51	18.2
Surgery e Chemotherapy	1	0.4
Chemotherapy and Radiotherapy	96	34.3
Refusal of Treatment	45	16.1
Patient's situation*		
No evidence of disease/complete remission	28	10.1
Partial remission	26	9.4
Stable disease	32	11.6
Progressing disease	86	31.0
Out of therapeutic possibility	6	2.2
Death	99	35.7

*Lost data

Table 4 shows the association between social determinants in health and death from the disease. Only the race/color variable revealed statistically significant significance in the present study, with p = 0.006.

Table 4. Association between social determinants in health and death of patients with oral squamous cell carcinoma UNACON, Feira de Santana, BA, 2010 to 2016

Variables	Death				P value
	Yes		No		
	n	%	n	%	
Age					
≤ 45 years-old	8	8.1	24	13.5	0.17
≥ 45 years-old	91	91.9	154	86.5	
Gender					
Male	83	83.8	138	77.5	0.21
Female	16	16.2	40	22.5	
Residence*					
Urban Area	54	68.4	102	79.1	0.08
Rural Area	25	31.6	27	20.9	
Size of the municipality of origin*					
Small size	45	45.9	71	41.1	0.14
Midsize	0	0	8	4.6	
Large	53	54.1	94	54.3	
Race/color*					
White	7	9.2	31	25	**0.006**
Black and Brown	69	90.8	93	75	
Marital Status*					
Single	41	44.1	69	41.6	0.88
Married/Common-law marriage	39	41.9	76	45.8	
Divorced	4	4.3	5	3	
Widower	9	9.7	16	9.6	
Scholarity*					
Illiterate	6	66.7	9	50	0.84
Elementary School	1	11.1	4	22.2	
High School	1	11.1	2	11.1	
Higher Education	1	11.1	3	16.7	
Occupation*					
With Occupation	42	57.5	79	56.8	0.92
Without Occupation	31	42.5	60	43.2	
Tobacco*					
Yes	86	93.5	134	87	0.1
No	6	6.5	20	13	
Exposure Time to Tobacco*					
≥ 25 years	49	83	72	83.7	0.2
Between 15 e 25 years	6	10.2	14	16.3	
< 15 years	4	6.8	0	0	
Alcoholic beverages*					
Yes	83	90.2	123	81.5	0.06
No	9	9.8	28	18.5	
Exposure Time to alcohol*					
≥ 25 years	39	86.7	52	78.8	0.8
Between 15 e 25 years	5	11.1	10	15.1	
< 15 years	1	2.2	4	6.1	

*Lost data

Discussion

Brazil is considered a country with high incidence for oral cancer. In Bahia were estimated for the 2018-2019 biennium, 760 new cases of the disease, representing 550 new cases in men and 210 in women[3]. In addition, a study conducted through the analysis of information from the Sistema de Informatização de Registros Hospitalares de Câncer (SisRHC), revealed 3,309 cases of oral cancer treated at ten hospitals in the state of Bahia during this period[10]. Oral cancer is a disease that has a significant mortality, regardless of age, gender, race and color, especially in cases where the disease is in the most advanced stage, corroborating the results of the present investigation[3].

The literature reports that the high incidence and mortality rates for oral cancer mainly affect low socioeconomic level populations[6,8], which reveals an association between living conditions, disease occurrence, and prognosis[6].

The concept of Social Determinants in Health (SDH) points out that the living and working conditions of individuals and population groups are related to their health situation. Factors such as: social, economic, cultural, ethnic-racial, psychological and behavioral conditions may influence the occurrence of health problems and their risk factors in the population[11].

Due to the multifactorial etiology of oral cancer, SDHs are often overlooked. However, epidemiological studies have shown a strong association between socioeconomic conditions and disease occurrence. In addition, it should be considered that the main risk factors reported in the literature (smoking and alcoholism) are behavioral / lifestyle factors, and according to social determinants theory, these factors may be conditioned by social determinants[7,8].

The highest prevalence of oral cancer occurs in middle-aged to elderly individuals, a fact that may be related to long exposure to risk factors for the disease[2]. In the present study, 87.6% of the disease occurred at the age of over 45 years. However, a considerable number of patients were affected aged 45 years or younger (12.4%). Studies related to oral SCC in this age group still have controversial results regarding etiology, biological behavior and prognosis. In general, there is an increased incidence rate in younger patients[12].

Regarding gender, in the present study most patients were male, these results corroborate the findings in the literature[13,14]. According to Warnakulasuriya[2], the relationship with males is due to greater exposure to risk factors in men, when compared to women, corroborating the results of the present study. However, regarding the predominance of SCC in relation to gender, this prevalence has decreased over the decades due to lifestyle changes in females, with greater exposure to carcinogens such as tobacco and alcohol. In the present study, the male: female ratio was 3.9:1.

Most patients in the present study (75.4%) lived in urban areas, corroborating the findings by Oliveira et al.[15], who also reveal higher frequency in individuals in the urban area. Studies indicate that the average time from symptom onset to decision to seek professional help in patients from rural areas differs significantly from those living in urban areas[16]. Although the present study did not assess the issue of accessibility of health services, the location of the present study ("Unidade de Alta Complexidade em Oncologia" in the municipality of Feira de Santana) and the weaknesses of the Health System should also be taken into consideration. with regard to access to health services of the rural population of the municipality and of the agreed municipalities.

Regarding race/color, the study by Gouvea et al.[17] reported that oral SCC affects mainly white skin race/color. In the present study, 81% of the patients were black or brown, these data corroborate the findings of the study by Santos et al.10, who studied the cases registered in the "Sistema de Informatização de Registros Hospitalares de Câncer" (SisRHC) in the state

of Bahia. Disagreement with other studies may be related to the predominance of brown and black color in the population of the State of Bahia. Nevertheless, some studies have found increasing mortality trends for individuals considered black and stationary for whites[18].

The literature reports that economically disadvantaged populations have the highest risk of developing the disease, factors such as income and education are related to the incidence of cancer[6]. These results are in agreement with the findings of Dantas et al.[6] and Johnson et al.[19], who showed a higher incidence of the disease in individuals with low education and a high frequency of individuals with low education in a population with oral cancer, respectively.

Tobacco use and alcohol intake are considered the main risk factors for oral cancer. The risk for developing the disease is increased depending on the type, frequency and duration of the habit. The risk is greater when the duration of smoking is longer than 20 years and the daily frequency of smoked cigarettes is greater than 20 cigarettes per day. With regard to alcohol, the risk is 2 to 3 times higher in individuals who consume 4-5 glasses of drinks daily than among non-drinkers[20]. The results of the present study reveal that the vast majority of individuals were exposed to the main risk factors (89.6% and 85%, respectively) for 25 years or more (83.2% and 82.3%, respectively). Similar results were found in studies such as de Silva et al.[16] who also find a higher frequency of smokers and alcoholics.

Individual lifestyles are factors that have a strong influence on health conditions, as these may be conditioned by social determinants. Thus, the relationship of lifestyle factors, such as tobacco use and alcohol consumption, in low-income individuals has been proven, showing that socioeconomic conditions are directly related to health indicators, in which socially disadvantaged groups tend to have greater contact with these risk factors[7,11].

Regarding the clinical characteristics of oral cancer, most findings were compatible with the literature. Most lesions had tumor site in the tongue region (37.9%) and were diagnosed at advanced stages (84.7%). Similar results were reported in the studies by Kaminagakura[21] et al, Gouvea[17] et al. and Komolmalai et al.[14]. Regarding tumor differentiation, in the present study the results indicate that most cases were classified as moderately differentiated (48.9%).

The results of this study regarding treatment reveal the high frequency of combination therapy. The choice of oral cancer treatment depends on factors such as anatomical location, extent of the disease, and especially clinical staging and physical condition of the patient[22]. In the present study, chemotherapy-associated radiotherapy was the most frequent. These results reflect the high frequency of late-diagnosed elderly patients, who tend to be treated with combined and more complex therapies. In addition, the percentage of patients found in this study who did not undergo cancer treatment deserves special mention (16.1%), in which factors related to income and mobility may be associated. The present study, however, did not evaluate this relationship.

Living conditions may also be related to the prognosis of the disease. In this study, the variable with statistical significance for death was race/color. According to Molina et al.[9], head and neck cancers have a high overall mortality with disproportionate impact on black and poor patients and these disparities by race and socioeconomic status are not completely explained by demographics, comorbid conditions or undertreatment.

The study by Ragin et al.[23] revealed that black patients with oral and laryngeal cancer were more likely to be diagnosed with advanced stages than white, after adjusting for socioeconomic status and other confounding factors.

According to Cruz[24], black race/color may be associated with a worse prognosis of diseases when compared to other racial groups, indicating late diagnosis, difficult access to health services, and differences in treatment among black individuals. In this sense, it should be considered that race/color is a variable of social determination, in which different groups reflect differences in living conditions and that in Brazil racial inequalities impact access to belongings and services, including health services and it may result in unequal treatment and prognosis[25].

Therefore, it is necessary to consider the limitations of the present study. As it is a study developed through secondary data, a large amount of missing data is observed, which makes the statistical analysis difficult and, consequently, the presence of association between some variables. In addition, the short period of the study, due to the implementation of the service in the municipality and the availability of data, resulted in a reduced number of cases, making more difficult the complex statistical analyzes. In this sense, it is recommended that further studies with a longer period of time and more robust statistical analyzes be conducted in order to better verify the association between social determinants in health and disease prognostic factors.

Conclusion

In the present study, it was observed that among the sociodemographic and lifestyle covariates, race/color was positively associated with statistical significance regarding death, indicating a worse prognosis related to black and brown patients. In addition, these results show that early diagnosis for oral cancer is a major challenge, pointing to the need for greater attention to early detection of lesions, as well as continuing education strategies for health professionals and education activities in order to raise awareness among the population about the main risk factors of the disease, especially in populations with worse living conditions.

Studies such as this one, which evaluate the impact of social determinants on health on the prognosis of diseases such as oral cancer, may support interventions and strategies for disease prevention, control and mortality, as they contribute to a broader understanding of health care. , allowing the health service to better understand the profile of cancer patients and factors associated with prognosis, seeking to improve the quality of service provided to patients, especially for patients in worse life situations.

Author contributions

Amorim MM conducted the study design, data analysis and interpretation, writing and critical review of the manuscript's intellectual content. Lisboa LJ and Conceição SS contributed to the interpretation of the data and writing of the manuscript's intellectual content. Almeida TF contributed to the study conception and design, data analysis, writing and critical review of the manuscript's intellectual content. Freitas VS contributed to the study design, data analysis and interpretation, writing and critical review of the manuscript's intellectual content. All authors approved the final version of the manuscript.

Competing interests

No financial, legal or political conflicts involving third parties (government, companies and private foundations, etc.) have been declared for any aspect of the work submitted (including but not limited to grants and funding, advisory board membership, study design, preparation manuscript, statistical analysis, etc.).

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