

UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE
CENTRO DE CIÊNCIAS DA SAÚDE
PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS DA SAÚDE

CÂNCER DE BOCA E OROFARINGE: TENDÊNCIAS
E ANÁLISE DE SOBREVIVÊNCIA EM NATAL (RN)

Paulo Roberto Medeiros De Azevedo

Natal

2010

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E ANÁLISE DE SOBREVIDA EM NATAL (RN)

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PROGRAMA DE PÓS-GRADUAÇÃO
EM CIÊNCIAS DA SAÚDE, COMO
PARTE DOS REQUISITOS
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DOUTOR

Paulo Roberto Medeiros De Azevedo

Orientador: Prof^o Dr. Antonio de Lisboa Lopes Costa

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Coordenadora: Profa. Dra. Técia de Oliveira Maranhão

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Banca examinadora:

Presidente da Banca: Prof^o Dr. Antonio de Lisboa Lopes Costa

Membros da Banca

Prof^a Dra Hébel Cavalcanti Galvão

Prof^a Dra Maria Angela Fernandes Ferreira

Prof^o Dr Márcio Campos Oliveira

Prof^a Dra Shirley Suely Soares Veras Maciel

Natal

2010

DEDICATÓRIA

- As minhas filhas Clarissa Rackel, Ana Clara e Maria Luíza, por estarem sempre ao meu lado e pela importância que têm em minha vida.
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LISTA DE ABREVIATURAS

RN – Rio Grande do Norte

CID – Classificação Internacional de Doenças

IARC – International Agency for Research in Câncer

RCBP – Registro de Câncer de Base Populacional

INCA – Instituto Nacional de Câncer

UFRN – Universidade Federal do Rio Grande do Norte

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RESUMO

Introdução: O câncer de boca é classificado como uma das dez maiores incidências de câncer no mundo. No Brasil, as taxas de incidência e de mortalidade por esse câncer encontram-se entre as mais elevadas do mundo. Para o câncer intraoral (língua, gengiva, base da boca e outras e não especificadas partes da boca), a taxa acumulada de sobrevida após 5 anos é menor que 50%. **Objetivo:** Estimar a probabilidade acumulada de sobrevida após 5 anos, ajustar o modelo de regressão de Cox para os cânceres de boca e de orofaringe, segundo faixa etária, sexo, morfologia e localização, para a cidade de Natal, Brasil. Descrever os coeficientes de mortalidade e de incidência dos cânceres de boca e de orofaringe e as tendências desses coeficientes para a cidade de Natal, nos períodos de 1980 a 2001 e de 1997 a 2001, respectivamente. **Metodologia:** Foi obtida a sobrevida de pacientes registrados entre 1997 e 2001 no Registro de Câncer de Base populacional de Natal. Foram testadas as diferenças entre as curvas de sobrevida através do teste log-rank. O modelo de riscos proporcionais de Cox foi utilizado para estimativas das razões de riscos. O modelo de regressão linear simples foi utilizado para as análises de tendência dos coeficientes de incidência e de mortalidade. **Resultados:** A probabilidade acumulada após 5 anos para todos os casos foi de 22,9%. Os pacientes com neoplasia maligna indiferenciada têm 4,7 vezes mais risco de morrer do que aqueles com carcinoma epidermóide, enquanto que os pacientes com câncer de orofaringe têm 2,0 vezes mais risco de morrer do que aqueles com câncer de boca. Os coeficientes padronizados de mortalidade e de incidência do câncer de boca em Natal foram, respectivamente, 2,9 e 4,3 por 100 mil habitantes. Para o câncer de orofaringe

os coeficientes obtidos de mortalidade e de incidência foram, respectivamente, 1,1 e 0,7 por 100 mil habitantes. **Conclusão:** Identifica-se uma baixa taxa de sobrevida após 5 anos. Pacientes com câncer de boca apresentam menos risco de morte, independentemente dos fatores considerados neste estudo. Também de forma independente dos demais fatores, a neoplasia maligna indiferenciada apresenta um maior risco de morte. As magnitudes dos coeficientes de incidência encontradas não são consideradas elevadas, enquanto que de forma contrária estão as magnitudes dos coeficientes de mortalidade.

Palavras Chaves: Câncer de boca; câncer de orofaringe; sobrevida; incidência; Mortalidade; tendências.

1 - INTRODUÇÃO

Em alguns países desenvolvidos os cânceres de cabeça e pescoço constituem problema de saúde pública, ¹ representando cerca de 75% de todos os casos.² Dentre esses, estão os países europeus, onde se verifica crescimento significativo dos coeficientes de incidência e de mortalidade dos cânceres oral e de faringe.²

A Agência Internacional para Pesquisa do Câncer ³ em sua publicação intitulada “Cancer Incidence em Five Continents”, mostra as diferentes taxas de incidência verificadas entre populações das diversas áreas geográficas. Essas estatísticas apontam que a boca está entre as dez principais localizações anatômicas de câncer mais freqüentes em homens, assumindo a oitava posição no mundo todo. Entre os países desenvolvidos, encontra-se na décima posição, enquanto nos países em desenvolvimento, o câncer de boca assume a sétima posição dentre os demais. Nas análises isoladas, verifica-se que, na América do Sul, a posição é a mesma, enquanto no Brasil sobe para a sexta posição. Dados dos registros de câncer no Brasil indicam que essa doença constitui um sério problema, repercutindo na produtividade do país, visto que a maioria dos acometidos encontra-se numa faixa etária economicamente ativa.⁴

Registros de câncer e bases de dados, nacionais e internacionais, têm mostrado que os casos de cânceres da cavidade oral se distribuem de forma bastante diferentes com relação à incidência e à sobrevida.^{5,6,7} Diferentes fatores de risco, relacionados ao estilo de vida, são possíveis causas para essa variabilidade.^{5,8}

Este tema está apresentado neste estudo através de três artigos que escrevemos sobre os cânceres de boca e de orofaringe em Natal, cujos títulos são: a) Sobrevida de pacientes com câncer de boca e de orofaringe em Natal (RN), Brasil, 1997-2001; b) Tendências das incidências dos cânceres de boca e de orofaringe em Natal (RN), Brasil, 1997-2001 e c) Tendências da mortalidade por câncer de boca e de orofaringe em Natal (RN), Brasil, 1980-2001.

O título do projeto de estudo é: Câncer de boca e de orofaringe: tendências e análise de sobrevida em Natal (RN)

Apontados pelos dados epidemiológicos, os cânceres de boca e de orofaringe ocupam posição destacada em vários países, inclusive no Brasil, sendo elevadas a incidência e a mortalidade por tumores de língua, de assoalho da boca e de orofaringe. Assim, percebe-se a importância da realização de estudos epidemiológicos com análises de sobrevida e de tendências da mortalidade e da incidência desses cânceres, de forma a fornecer subsídios para avaliação dos programas de educação, prevenção e tratamento da referida doença em nosso meio.

Objetivos do estudo:

- ✓ Descrever os coeficientes de mortalidade pelos cânceres de boca e de orofaringe e suas tendências, segundo sexo e faixa etária para a cidade de Natal, no período de 1980 a 2001;
- ✓ Descrever os coeficientes de incidência dos cânceres de boca e de orofaringe e as tendências desses coeficientes, segundo sexo e faixa etária, para a cidade de Natal, no período de 1997 a 2001;
- ✓ Estimar a probabilidade acumulada de sobrevida após 5 anos e ajustar o modelo de regressão de Cox para os cânceres de boca e orofaringe, segundo

faixa etária, sexo, diagnóstico histo-patológico (morfologia) e localização, para a cidade de Natal, com base em registros de 1997 a 2001;

✓ Agrupar, através das técnicas multivariadas de “Análise de Agrupamento”, regiões da cidade de Natal, de acordo com os coeficientes de incidência.

2 - REVISÃO DA LITERATURA

Registros de câncer e bases de dados, nacionais e internacionais, têm mostrado que os casos de cânceres da cavidade oral se distribuem de forma bastante diferentes com relação à incidência e à sobrevida. Diferentes fatores de risco, relacionados ao estilo de vida, são possíveis causas para essa variabilidade.

Alguns estudos mostram que a taxa acumulada de sobrevida após 5 anos de pacientes com câncer de faringe está entre 20 e 60%, dependendo do estágio do tumor. Também de acordo com alguns trabalhos, a alta prevalência de alcoolismo tem contribuído para manter baixa a taxa acumulada de sobrevida dos pacientes com câncer de orofaringe e hipofaringe.

A probabilidade acumulada de sobrevida após 5 anos de pacientes com câncer de língua tem permanecido praticamente constante em todo o mundo, desde o início dos anos 70. Nos países desenvolvidos, essa taxa encontra-se em torno de 50%. Segundo Sugerman and Savage, para o câncer intraoral (língua, gengiva, assoalho de boca e outras e não especificadas partes da boca), a taxa acumulada de sobrevida após 5 anos é menor que 50%, principalmente para os casos em que emitiram metástase. Muitos fatores relacionados ao paciente, ao tumor e a tratamentos têm sido identificados na

predição da sobrevida de pacientes com câncer de língua. A sobrevida deste câncer tem melhorado nos últimos anos, sendo cerca de 80% a taxa acumulada após 5 anos para os casos da doença nos estágios I e II e de aproximadamente 50% para os estágios III e IV.

Trabalhos que tratam da sobrevida de pacientes com câncer oral e/ou faringe, como Tomar et al. e Yeole et al., mostram que maioria dos casos concentra-se na faixa etária entre 50 e 70 anos. Em outros estudos sobre esses cânceres verifica-se que as neoplasias comprometem particularmente o sexo masculino e têm o carcinoma epidermóide como tipo histopatológico predominante.

No estudo de La Rosa et al., realizado para a região da Umbria na Itália, correspondendo aos cânceres de códigos entre 143 e 145 da CID-9 (cavidade oral), com dados coletados entre 1978 e 1982, a taxa de sobrevida observada após 5 anos foi de 36%. Para o câncer de orofaringe a probabilidade de sobrevida observada após 5 anos nesse estudo foi de 30%. A sobrevida para pacientes com câncer de orofaringe encontrada no trabalho de Wong et al., realizado em um hospital de referência de Taiwan, com os dados de 1612 pacientes, a taxa de sobrevida observada após 5 anos foi de 59,15%.

Por outro lado, tem-se que aproximadamente 75% dos casos de câncer de orofaringe ocorrem em países desenvolvidos, sendo o sul da Ásia a região do mundo com maior número de casos deste câncer. Para Jordán et al., o câncer de boca é classificado como uma das dez maiores incidências de câncer no mundo.

Observa-se atualmente uma grande preocupação com a existência de tendência crescente na incidência do câncer oral em países desenvolvidos,

verificada principalmente na população de jovens do sexo masculino desses países. De acordo com Patroniere, os coeficientes de incidência padronizados pela idade do câncer de boca (compreendendo o conjunto dos cânceres de gengiva, assoalho de boca e outras e não-especificadas localizações), no período entre 1969 e 1999, tiveram crescimento significativo na Finlândia, Noruega, Suécia, Eslovênia e em Soarland (Alemanha), para ambos os sexos. Conforme o estudo de Patroniere, na cidade de São Paulo (Brasil) a incidência deste câncer aumentou significativamente na população do sexo feminino. No estudo de Conway et al. também foi identificada tendência crescente do câncer oral para ambos os sexos no Reino Unido, no período entre 1990 e 1999.

Na Tailândia, de acordo com Reichart et al., para a população do sexo masculino, no período entre 1988 e 1999, foi identificada tendência decrescente do câncer de boca (compreendendo o conjunto dos cânceres de gengiva, assoalho de boca e outras e não-especificadas localizações). Segundo este estudo, o coeficiente de incidência padronizado pela idade do câncer de boca nas populações de homens e de mulheres em 1999 eram, respectivamente, 1,2 e 1,1 por 100 mil habitantes. Verifica-se tendência decrescente do câncer de boca, para ambos os sexos, em Porto Rico, Bombaim (Índia) e Cingapura.

No trabalho de Patroniere foi identificada tendência decrescente do câncer de orofaringe, para ambos os sexos, em Cali (Colômbia) e Bombaim. Tendência decrescente desse câncer também foi verificada no trabalho de Reichart et al. na Tailândia, no período entre 1988 e 1999, sendo o decréscimo nesse país atribuído essencialmente a diminuição do hábito de fumar, segundo os autores. Conforme este estudo, os coeficientes de incidência padronizados

pela idade para os sexos masculino e feminino foram 0,8 e 0,2 por 100 mil habitantes, respectivamente.

No trabalho de Izarzugaza et al. para os Países Bascos, entre 1986 e 1994, foram obtidos resultados diferentes. De acordo com este estudo, a incidência do câncer de orofaringe permaneceu estável no referido período, sendo de 3,8 e 0,3 os coeficientes de incidência padronizados pela idade para os sexos masculino e feminino, respectivamente. Por outro lado, tendência crescente do câncer de orofaringe, para ambos os sexos, foi identificada por Patroniere em Iowa (USA), Noruega, Cracóvia (Polônia), Eslovênia, Suécia e Saarland (Alemanha).

De acordo com Laemmel et al., apesar da evolução tecnológica da medicina nas últimas décadas, a mortalidade por câncer de boca continua em níveis considerados altos, na maioria dos países desenvolvidos. No Brasil, segundo Kowalski, as taxas de incidência e de mortalidade por câncer de boca encontram-se entre as mais elevadas do mundo, sendo que o diagnóstico, que não deveria oferecer dificuldades em vista do fácil acesso à cavidade bucal, geralmente é feito nas fases mais avançadas de evolução da doença .

Conforme o trabalho de Silva et al., dados de registros de câncer no Brasil indicam que a taxa de mortalidade por câncer de boca passou de 1,32 por 100 mil habitantes em 1979 para 1,82 por 100 mil habitantes em 1998. Nesse período, para o sexo feminino, observou-se uma variação de 0,48 para 0,70 por 100 mil mulheres, enquanto que para o sexo masculino essa taxa variou de 2,16 para 2,96 por 100 mil homens.

No trabalho de Boing et al. foi identificada uma tendência estável do coeficiente de mortalidade por câncer de boca para ambos os sexos no Brasil,

no período de 1979 a 2002. Nesse estudo, por outro lado, identificou-se uma tendência crescente da mortalidade por câncer de boca nas regiões Sul e Nordeste. Ainda de acordo com esse trabalho, o coeficiente de mortalidade no Brasil por câncer de orofaringe é de 0,49 por 100 mil habitantes, com uma tendência classificada como crescente.

No trabalho de Biazevic et al. obteve-se que o coeficiente de mortalidade por câncer de orofaringe na cidade de São Paulo, Brasil, no período entre 1980 e 2002 é de 0,60 por 100 mil habitantes, com tendência crescente. Tendência crescente para o coeficiente de mortalidade por câncer de orofaringe também foi observada na Escócia, no período de 1960 a 1989, e no Japão, entre os anos de 1950 e 1994.

Nieto and Ramos encontraram um coeficiente de mortalidade pelos cânceres de língua, glândula salivar, boca e orofaringe na Espanha, padronizado pela idade, igual a 6,23 por 100 mil habitantes para o sexo masculino, no período entre 1990 e 1994. Para o sexo feminino, o coeficiente obtido nesse trabalho foi de 0,83 por 100 mil habitantes. Ainda de acordo com esse estudo, a mortalidade por câncer bucal tem tendência crescente nesse país para ambos os sexos.

Segundo o trabalho de Borrell et al., no período entre 1968 e 1987 a mortalidade por câncer de boca em Cuba estava com tendência caracterizada como decrescente. No trabalho de Jordan et al., para o período de 1987 a 1996 a mortalidade por câncer bucal nesse país apresentava uma tendência classificada como estável, sendo a mortalidade do sexo masculino três vezes mais freqüente do que a do sexo feminino, coincidindo com resultados internacionais.

Conforme Câncer research UK, em 2003, o coeficiente de mortalidade no Reino Unido era de 2,2 por 100 mil habitantes e, segundo Stewart & Kleihues, estima-se que por ano os tumores de boca e de faringe são responsáveis por cerca de 200 mil mortes em todo o mundo.

No Brasil, segundo o trabalho de Boing et al., nas décadas de 80 e 90 foi verificado um crescimento na mortalidade devido o câncer de boca. Da mesma forma, conforme o trabalho de Ferlay et al., o câncer de orofaringe tem uma das mais altas taxas de mortalidade entre todas as neoplasias.

De acordo com o estudo de Kowalski, apesar do câncer bucal poder ser prevenido e ter como ser detectado facilmente em estágios iniciais, no Brasil esse câncer não tem recebido atenção suficiente, nem da população nem dos profissionais de saúde. E conforme o trabalho de Armênio e Biazevic, diante do fato de que o câncer bucal é classificado como uma das oito principais causas de óbitos por câncer no Brasil, justifica a importância de estudos que detalhem com precisão os fatores relacionados com sua prevalência.

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Survival of patients with mouth and oropharyngeal cancer in Natal, Brazil

Survival of mouth/oropharyngeal cancer

Paulo Roberto Medeiros de Azevedo ^{a,*}, Maria Angela Fernandes Ferreira ^b, Antonio de Lisboa Lopes Costa ^c

^a PhD. – student - Programa de pós-graduação do Centro de Ciências da Saúde- Universidade Federal do Rio Grande do Norte, Natal, RN. Brazil.

^b PhD. - Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: angelaf@ufrnet.br

^c PhD. - Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: antoniodelisboa@uol.com.br

* Corresponding author: Tel.: +55-84-3215 3787; fax: +55-84- 3215 3685

Address: Departamento de Estatística, Campus universitário - Av. Senador Salgado Filho, Lagoa Nova, Natal, RN. Brazil. CEP: 59.078-970. E-mail: prma@ccet.ufrn.br

Abstract

Purpose

Estimate the accumulated survival probability after five years and adjust the Cox regression model for mouth and oropharyngeal cancers, according to age range, sex, morphology, and location, for the city of Natal, Brazil.

Methods

Survival data of patients registered between 1997 and 2001 was obtained from the Population-based Cancer Record of Natal. Differences between the survival curves were tested using the log-rank test. The Cox proportional risk model was used to estimate risk ratios.

Results

The median survival time obtained for all the cases was 9.5 months, with accumulated probability after five years of 22.9%. The patients with undifferentiated malignant neoplasia were 4.7 times more at risk of dying than those with epidermoid carcinoma, whereas the patients with oropharyngeal cancer had 2.0 times more at risk of dying than those with mouth cancer.

Conclusions

A low survival rate after five years was identified and no improvement in prognosis was observed over time. Patients with oropharyngeal cancer had a greater risk of dying, independent of the factors considered in this study. Also independent of other factors, undifferentiated malignant neoplasia posed a greater risk of death.

Keywords: Mouth cancer; oropharyngeal cancer; survival

Introduction

In some developed countries, cancers of the head and neck are the greatest public health problem (1), accounting for around 75% of all cases (2). European countries show a significant growth in the incidence and mortality coefficients of oral and pharyngeal cancers (2).

Around 75% of oropharyngeal cancer cases occur in developed countries, the south of Asia being the region recording the greatest number of cases (3) and (4). According to Jordan et al. (5), mouth cancer is classified as having one of the ten highest cancer incidences worldwide.

Oral cancer does not occur homogeneously among the regions of the world, which may be explained either by the fact that a population of a determinate area is more susceptible to the disease or that it is more exposed to the risk factors. Similarly, these variations are also observed among different ethnic groups in a same location, owing to differences in genetic patterns and lifestyle.

The International Agency for Research in Cancer (IARC)(6), in its publication entitled "Cancer Incidence on Five Continents", shows the different incidence rates found in populations from diverse geographic areas. These rates indicate that mouth cancer is among the ten most frequent anatomic locations in men, occupying the eighth position worldwide. In developed countries, it is the tenth most frequent location, whereas in developing countries, mouth cancer occupies the seventh position. Isolated analyses show that in South America the ranking is the same, whereas in Brazil it rises to sixth

place. Cancer data in Brazil indicates that this disease is a serious problem, having repercussions on productivity, given that most of those affected are in the economically active age range (7).

National and international cancer records and databases have shown that cancer cases of the oral cavity are quite differently distributed with respect to incidence and survival (8), (9) and (10). Different lifestyle-related risk factors are possible causes for this variability (8) and (11).

Some studies show that the accumulated survival rate after five years of patients with pharyngeal cancer is between 20% and 60%, depending on the stage of the tumor (12),(13) and (14). In addition according to some investigations, the high prevalence of alcoholism has contributed to maintaining the accumulated survival rate of patients with oropharyngeal and hypopharyngeal cancer low (13) and (15).

The accumulated survival probability of patients with tongue cancer after five years has remained practically constant throughout the world since the early 1970s. In developed countries, this rate is around 50% (16), (17) and (18). According to Sugerman and Savage (19), for intraoral cancer (tongue, gum, floor of the mouth, and other non-specified parts of the mouth), the accumulated survival rate after five years is less than 50%, mainly for cases in which metastasis occurs. Many factors related to the patient, type of tumor and treatment have been identified in predicting the survival of patients with tongue cancer (16), (20) and (21). The survival of this cancer has improved in recent years; around 80% of the accumulated rate after five years for stages I and II of the disease, and is approximately 50% for stages III and IV (21), (22) and (23).

The aim of the present study is to estimate accumulated survival probability after five years and adjust the Cox regression model for mouth and oropharyngeal cancers, according to age range, sex, morphology, and location, for the city of Natal, Brazil, based on records from 1997 to 2001.

Methods

Survival data of mouth and oropharyngeal cancers in the city of Natal, Brazil, were obtained from the databank of the Subsecretariat of Epidemiological Vigilance of the Rio Grande do Norte State Health Secretariat, the Population-Based Cancer Records (PBCR) and Dr. Luiz Antônio Hospital. Cancers whose ICD-10 codes were between C02.9 and C10.9 were considered in this study. The cancers studied were divided into two types: oropharynx (C10.9) and the remainder, classified here as mouth cancer.

The total overall survival, after up to five years of follow-up, of patients registered between 1997 and 2001 at the PBCR of Natal, was analyzed in this study. The death of the patient was considered the event of interest, whereas the data pertaining to individuals that terminated the study alive or those who did not have updated follow-up, were censored. For survival analysis, November 12, 2006 was considered the follow-up deadline.

The accumulated survival probability function curve (Kaplan-Meier estimator) was obtained for each of the variable categories: sex, age range, year of diagnosis, diagnostic group, and cancer location. The differences between the survival curves were analyzed using the log-rank test, considering

cases in which $p < 0.05$ as having statistically significant differences. The Cox proportional risk model was used to estimate risk ratios.

Statistica 7.0 software and the R system were used to calculate accumulated survival probabilities and their corresponding graphs, as well as to perform the log-rank test and the adjustment of the Cox proportional risk model.

Results

Of the 131 mouth cancer cases from the PBCR of Natal, between January 1, 1997 and December 12, 2001, follow-up could not be obtained for 16 of the patients (12%); that is, 115 patients with follow-up updated to December 12, 2001 were observed. It was found that 80 (69.6% of the followed-up patients) of these patients died, 28 (24.3% of the followed-up patients) of whom died within one month of diagnosis. In 25 of these (21.7% of the followed-up patients) the diagnosis was only established on the death certificate.

Table 1 shows the distribution of cases, the median time and accumulated survival probabilities according to age range, sex, year of diagnosis, diagnostic group and location. The median survival obtained for all the cases was 9.5 months with accumulated survival after five years of 22.9%. The accumulated survival probabilities showed no statistically significant differences between the sexes, age ranges and years of diagnosis ($p=0.107$, $p=0.534$ and $p=0.134$, respectively). Thus, with respect to the diagnostic group, undifferentiated malignant neoplasia had the lowest accumulated survival

probabilities and in terms of location, oropharyngeal cancer had a lower survival curve than that of mouth cancer.

The Cox regression model was used to make a number of estimates to determine the risks associated to the variables considered in this study, as shown in Table 2. Univariate regression showed the variables Diagnostic group and Cancer location as significant. These variables are also independent predictors (prognostic value variables) of survival in the multiple regression. That is, multivariate analysis with respect to the diagnostic group shows that patients with undifferentiated malignant neoplasia have 4.7 times more risk of dying than those with epidermoid carcinoma. On the other hand, with respect to cancer location, patients with oropharyngeal cancer have 2.0 times more risk of dying than those with mouth cancer.

Discussion

The results of this study show that the patients' ages had a similar distribution to other investigations on the survival of patients with oral and/or pharyngeal cancer, such as, those by Tomar et al.(24) and Yeole et al.(25), where most of the cases occurred in the 50-70 year age range. Similarly, the distribution of the sex variable was similar to that of several other studies on oral and/or pharyngeal cancer, where it was found that neoplasias compromise mainly men (26). This study also corroborates worldwide findings, where epidermoid carcinoma is the predominant histopathological type (26).

The log-rank test detected no significant difference between the survival of men and women, but found that women had greater accumulated survival probability. The same occurred with age range, where it was observed that

patients between the ages of 50 and 70 years had the highest rates. The log-rank test also identified no differences in accumulated probabilities over the course of the period studied, indicating the nonexistence of a survival tendency in patients with mouth and oropharyngeal cancer. However, in the last two years of observation, a rate decrease was observed, mainly when compared with those obtained for 1998, whose accumulated survival probabilities are the highest for the period studied.

This study underscores the fact that undifferentiated malignant neoplasia had the lowest survival probabilities, differing significantly from epidermoid carcinoma probabilities. For undifferentiated malignant neoplasia, the accumulated survival probability after five years was 0.0%, whereas for epidermoid carcinoma, the rate was 26.8%. Similarly, there was a statistically significant difference between mouth and oropharyngeal cancer survival rates. The latter had a null survival probability after five years, while the former had a rate of 26.2%.

A result approximating that obtained in our work was found by La Rosa et al. (27), in a study performed on the oral cavity, corresponding to cancers with ICD-9 codes between 143 and 145. This study, conducted in the Umbria region of Italy, with data collected between 1978 and 1982, obtained a survival rate after five years of 36%. For oropharyngeal cancer, however, the survival probability observed after five years was 30%, differing significantly from the result we found for Natal, Brazil. The survival of patients with oropharyngeal cancer found in our study is also well below that obtained by Wong et al. (28), in a study conducted in a cancer hospital in Taiwan, with the data of 1612 patients. The survival rate observed after five years was 59.15%.

Our results are also quite unfavorable when compared to the study carried out by Tomar et al. (24), in Florida. In this study, the median survival time obtained for oral cavity cancer (codes between ICD-10 C00.0 and C06.9) was 22.6 months, representing nearly twice the median time we found for mouth cancer in Natal.

When mouth cancer affects young people, even though there are new etiological factors for the disease, most were exposed to traditional risk factors, such as, smoking, alcoholism, and low vegetable and fruit consumption (29). In this sense, the epidemiological data in Brazil on mouth cancer would be more acceptable if there was more government action in reducing alcohol and tobacco consumption (30).

Another finding is that the worsening morbidity and mortality profiles of oral cancer have occurred in areas with low socioeconomic indicators (31). This is explained by the association between alcohol and tobacco dependency and a larger number of alcoholics among low income individuals (32).

Similarly, La Vecchia et al.(33), found that different income levels are directly related to health indicators. Low income population groups tend to have precarious oral health conditions, as well as nutritional deficiencies, common findings in cases of mouth and pharynx cancer.

Conclusions

Mouth and oropharyngeal cancer survival in Natal, Brazil for the period considered showed a low survival rate after five years when compared with the results of a number of other studies, and showed no improvement in prognosis over the years. In addition, the patients with oropharyngeal cancer had a greater risk of dying, independent of the factors considered in this study. Also, independent of other factors, it was found that undifferentiated malignant neoplasia posed a higher risk of death.

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Table 1.

Number, percentage, median time and accumulated survival probabilities for mouth and oropharyngeal cancer, according to the study variables, in Natal, Brazil, between January 14, 1997 and December 12, 2001.

Variable	Number	%	Median survival time	Accumulated Survival Probability (%)				*p
				1 year	2 years	3 years	5 years	
age range								
<50	24	20.9	7.9	40.0	25.9	25.9	9.7	0.534
50 – 70	61	53.0	13.4	52.3	35.4	30.6	28.1	
> 70	30	26.1	7.3	34.8	27.1	21.7	21.7	
sex								
male	71	61.7	7.4	38.8	26.3	26.3	17.7	0.107
female	44	38.3	13.5	54.6	39.0	30.6	30.6	
year of diagnosis								
1997	25	21.7	7.8	45.0	36.0	36.0	36.0	0.134
1998	13	11.3	45.1	64.6	64.6	64.6	48.5	
1999	34	29.6	7.7	46.0	34.6	23.1	23.1	
2000	22	19.1	11.5	48.7	19.5	13.0	6.5	
2001	21	18.3	3.5	28.6	17.9	17.9	11.9	
diagnostic group								
- epidermoid carcinoma	83	72.2	13.0	52.6	38.8	33.1	26.8	0.000
- undifferentiated malignant neoplasia	17	14.8	0.0	0.0	0.0	0.0	0.0	
- others	15	13.0	12.5	53.3	26.7	26.7	26.7	
location								
oropharyngeal	19	16.5	1.4	17.5	0.0	0.0	0.0	0.011
mouth	96	83.5	12.1	50.2	35.5	31.1	26.2	
total	115	100.0	9.5	44.8	31.0	27.2	22.9	

*p of the log-rank test for equality between strata.

Table 2.

Prognostic factors defined by the Cox regression, univariate, and multiple models.

Variables	Univariate Regression			Multivariate Regression		
	Risk Ratio (RR)	CI _{95%} (RR)	p	Risk Ratio (RR)	CI _{95%} (RR)	p
sex						
male	1.42	[0.90 – 2.26]	0.1342	1.21	[0.70 – 2.11]	0.4972
female	1.0	-	-	1.0	-	-
age range						
<50	1.04	[0.56 – 1.92]	0.9078	0.96	[0.49 – 1.90]	0.9096
50 – 70	0.80	[0.48 – 1.36]	0.4156	0.68	[0.38 – 1.21]	0.1897
> 70	1.0	-	-	1.0	-	-
diagnostic group						
- epidermoid carcinoma	1.0	-	-	1.0	-	-
- undifferentiated malignant neoplasia	4.86	[2.64 – 8.96]	0.0000	4.71	[2.48 – 8.93]	0.0000
- others	1.12	[0.58 – 2.14]	0.7380	1.12	[0.57 – 2.18]	0.7413
Location						
oropharyngeal mouth	2.34	[1.33 – 4.12]	0.0033	1.95	[1.06 – 3.57]	0.0318
	1.0	-	-	1.0	-	-

**Tendencies of mouth and oropharyngeal cancer incidence in Natal, Brazil,
between 1997 and 2001**

Mouth and oropharyngeal cancer incidence

**Paulo Roberto Medeiros de Azevedo ^{1,*}, Maria Angela Fernandes
Ferreira ², Antonio de Lisboa Lopes Costa ³**

¹ Programa de pós-graduação do Centro de Ciências da Saúde, Universidade Federal do Rio Grande do Norte, Natal, RN. Brazil.

² Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: angelaf@ufrnet.br

³ Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: antoniodelisboa@uol.com.br

* Corresponding author: Tel.: +55-84-3215 3787; fax: +55-84- 3215 3685
Address: Centro de Ciências Exatas e da Terra, Campus universitário - Av. Senador Salgado Filho, Lagoa Nova, Natal, RN. Brazil. CEP: 59.078-970. E-mail: prma@ccet.ufrn.br.

Abstract

Objectives: Describe the incidence coefficients of mouth and oropharyngeal cancers for the city of Natal, Brazil, between 1997 and 2001. **Materials and methods:** The data were provided by the Population-based Cancer Registry (PBCR) of Natal, capital of the state of Rio Grande do Norte, Brazil. The simple linear regression model was used for tendency analyses. **Results:** The mouth cancer incidence coefficient for Natal was 4.3 per 100 000 inhabitants (3.3 and 5.9 per 100 000 inhabitants for women and men, respectively). The standardized mouth cancer incidence coefficient for men exhibits a decreasing linear tendency. The standardized oropharyngeal cancer incidence coefficient for Natal was 0.7 per 100 000 inhabitants (0.1 and 1.5 per 100 000 inhabitants for women and men, respectively). The standardized oropharyngeal cancer incidence coefficient for women exhibits a decreasing linear tendency. All the other coefficient series analyzed have a tendency classified as stable. **Conclusion:** The magnitudes of the incidence coefficients found are not considered elevated and are classified as having a decreasing tendency of mouth cancer incidence in men and of oropharyngeal cancer in women. We recommend other studies that may lead to public policies which result in decreasing tendencies for the other series.

Keywords: Mouth cancer; oropharyngeal cancer; incidence; tendencies

Introduction

In some developed countries, head and neck cancers are a major public health problem (1), representing around 75% of all the cases (2). European countries have recorded significant increases in incidence coefficients and mortality from oral and pharyngeal cancers (2). Mouth cancer is classified as having one of the ten highest cancer incidences in the world (3).

The occurrence of this disease is not homogeneous worldwide, which could be explained either by the fact that the population of a determinate region is more susceptible to the disease or because it is more exposed to risk factors.

The International Agency for Research on Cancer (IARC) (4) in its publication entitled "Cancer Incidence on Five Continents", shows the different incidence rates (standardized for the world population) found among populations from different geographic areas. These statistics show that mouth cancer is one of the ten most frequent anatomic locations of cancer in men (eighth position worldwide). In developed countries, it occupies tenth place, whereas in developing countries mouth cancer is the seventh most common location. Isolated analyses show in South America, the position is the same, whereas in Brazil it rises to the sixth place.

Cancer data in Brazil indicate that this disease is a serious problem, affecting productivity, given that most of the afflicted individuals are in the economically active age range (5). According to Kowalski (6), the incidence and mortality rates for mouth cancer in the country are among the highest in the world.

Although information on incidence and mortality from cancer of the upper respiratory and digestive pathways, in population terms, is scarce (7), it is known that mouth cancer is among the ten most frequent tumors found in Brazilian men. In some Population-based Cancer Registries (PBCR), the incidence rates of mouth cancer in men are ten times higher than those of women (8).

Analysis of cancer incidence allows us to assess how preliminary prevention affects the rates and distribution of the disease in specific populations owing to changes in risk behavior. This is an important characteristic when evaluating historical incidence and mortality by a thorough monitoring of cancer in specific locations (9). Knowledge of incidence and mortality is crucial for preventing and controlling mouth cancer, by favoring planning, assessment and follow up of activities, which aim at reverting the epidemiological profile of this disease (5).

The purpose of this study is to describe the incidence coefficients of mouth and oropharyngeal cancers as well as the tendencies of these coefficients, according to sex and age group, in the city of Natal, Brazil, between 1997 and 2001.

Materials and methods

The incidence data of mouth and oropharyngeal cancers in Natal, Brazil, were provided by the Population-based Cancer Registry (PBCR) of Natal, capital of the state of Rio Grande do Norte, between 1997 and 2001. This registry considered the eligible cases of Natal residents who were diagnosed with malignant neoplasias. The data include all the cases of tumors classified as malignant, invasive or in situ. In this study, we observed cancers whose ICD-10 codes were between C02.9 and C10.9. The cancers were divided into two types: oropharyngeal (C10.9) and the remainder, classified here as mouth cancer. Was obtained the standardized incidence coefficient by the direct method using Segi's world population of 1960 as standard population. These coefficients were calculated considering the total number of new cases and separately for each sex and age group.

In the temporal series analysis of incidence coefficient tendencies, we used the least square method to adjust the simple linear regression model $Y_t = \beta_0 + \beta_1 t + \varepsilon_t$. In this model Y_t is the incidence coefficient, $t = \text{year} - 1999$ and ε_t are non-correlated random errors, with mean zero and constant variance. The assessment of the existence of a tendency in the series was based on the statistical test whose null and alternative hypotheses are $H_0: \beta_1 = 0$ and $H_1: \beta_1 \neq 0$, respectively. That is, the series is considered stable when the null hypothesis is not rejected ($p > 0.05$). If the null hypothesis is rejected ($p \leq 0.05$), the series is classified as having a rising or falling tendency, depending on whether the signal is positive or negative, respectively, of the estimate obtained for

parameter β_1 . In each adjustment performed, an analysis of residues was done to assess mainly the hypothesis of constant variance.

Statistica 7.0 was used to calculate the incidence coefficients and to analyze tendencies.

Results

A total of 134 new cases of mouth and/or oropharyngeal cancer were registered in Natal between 1997 and 2001. Of this total, 76 (56.7%) were men and 58 (43.3%) were women. These results correspond to incidence coefficients of 7.3 and 3.4 per 100 000 inhabitants for men and women, respectively. The total incidence coefficient was 5.0 per 100 000 inhabitants. More than half of the new cases observed (52.2%) were in individuals aged between 50 and 70 years, whereas the percentage of cases of individuals younger than 50 years of age was 20.9%. There were 115 new cases of mouth cancer, accounting for 85.82% of all the new cases, and of these 52.2% were men. For this cancer, the incidence coefficients for men, women and total were 5.9, 3.3 and 4.3 per 100 000 inhabitants, respectively. Oropharyngeal cancer amounted to 19 new cases, 16 (84.2%) of which were men and 3 (15.8%) women. For this cancer, the incidence coefficients obtained for men, women and total were 1.5, 0.1 and 0.7 per 100 000 inhabitants, respectively. These incidence coefficient data for the age groups of each location are shown in Table I.

Table I: Distribution of the number and percentage of new cases and of the incidence coefficients of mouth and oropharyngeal cancers, according to location, sex and age group, in Natal, 1997 a 2001.

Variable	New cases		Incidence coefficient (per 100 000)
	Nº	%	
a) location: mouth			
sex			
female	55	47.8	3.3
male	60	52.2	5.9
age group (years)			
< 50	24	20.9	0.8
50 - 70	60	52.2	16.3
> 70	31	26.9	24.5
b) location: oropharynx			
sex			
female	3	15.8	0.1
male	16	84.2	1.5
age group (years)			
< 50	4	21.1	0.1
50 - 70	10	52.6	2.7
> 70	5	26.3	4.0
c) location: mouth and oropharynx			
sex			
female	58	43.3	3.4
male	76	56.7	7.3
age group (years)			
< 50	28	20.9	0.9
50 - 70	70	52.2	19.0
> 70	36	26.9	28.5

We carried out tendency analyses of the historical series of incidence coefficients of each one of the mouth and oropharyngeal cancers. The statistics of historical series of incidence coefficients of mouth cancer are summarized in Table II, with adjustments to the regression models for the series of incidence coefficients. In the adjustments obtained, the p-value of the test on β_1 is identified. These results show that the series of standardized incidence coefficients of mouth cancer in men exhibits a decreasing linear tendency, given that the estimate of β_1 is negative (-0.86) and the p-value of the test on β_1 is 0.0097. All the other series are classified as stable, since the p-values of the respective tests on β_1 are greater than 0.05.

Table II: Tendency analysis of incidence of mouth cancer, according to demographic characteristics, in Natal, Brazil, between 1997 and 2001.

Variable	Estimated model	p	Tendency
total	4.49 - 0.48(year – 1999)	0.2895	stable
sex			
female	3.30 - 0.24(year – 1999)	0.6825	stable
male	5.81 - 0.86(year – 1999)	0.0097	decreasing
age group (years)			
< 50	0.81 - 0.05(year – 1999)	0.6995	stable
50 – 70	16.64-2.07(year – 1999)	0.4515	stable
> 70	24.55-0.44(year – 1999)	0.8234	stable

The statistics of the historical series of incidence coefficients of oropharyngeal cancer are summarized in Table III, with adjustments to the regression models for the series of incidence coefficients. These results show that the series of incidence coefficients of oropharyngeal cancer in women can be classified as having a decreasing linear tendency, given that the estimate of β_1 is negative (-0.09) and the p-value of the test on this parameter is 0.0521. All the other series are classified as stable.

Table III: Tendency analysis of the incidence coefficients of oropharyngeal cancer, according to demographic characteristics, in Natal, Brazil, between 1997 and 2001.

Variable	Estimated model	p	Tendency
total	0.74 - 0.09(year – 1999)	0.4129	stable
sex			
female	0.15 - 0.09(year – 1999)	0.0521	decreasing
male	1.56 - 0.08(year – 1999)	0.7370	stable
age group (years)			
< 50	0.13 +0.03(year – 1999)	0.2070	stable
50 – 70	2.77-0.24(year – 1999)	0.6812	stable
> 70	4.15-2.52(year – 1999)	0.2105	stable

Discussion

There is currently great concern about the growing tendency of oral cancer in developed countries, particularly in the population of young men in these countries (10, 11). According to Patroniere (7), the incidence coefficients of mouth cancer (including gingival, floor of the mouth and other non-specifically located cancers) between 1969 and 1999 showed a significant increase in Finland, Norway, Sweden, Slovenia and in the Saarland (Germany) for both sexes. According to this study, in the city of São Paulo, Brazil the incidence of

this cancer rose significantly in women. A growing tendency of oral cancer in both sexes was also found in the United Kingdom between 1990 and 1999 (12).

In our study, however, we detected a decreasing tendency of mouth cancer in men in Natal, Brazil, a result that deserves to be underscored. Also in Thailand was identified a decreasing tendency of mouth cancer (including gingival, floor of the mouth and other non-specifically located cancers) in men between 1988 and 1999. The incidence coefficients of mouth cancer in men and women in 1999 were 1.2 and 1.1, respectively, per 100 000 inhabitants (13). For both sexes was found a decreasing tendency of mouth cancer in Puerto Rico, Bombay (India) and Singapore (7).

It is also worth noting the decreasing tendency of oropharyngeal cancer found by our study in the female population of Natal. For this cancer, however, a very large difference was found between the incidence coefficients for men and women, resulting in a 15:1 ratio. On the other hand, comparing the incidences obtained in this study with those obtained in São Paulo (7), we observe that for both sexes the incidence coefficients obtained in Natal are well below those found in São Paulo, whose incidence coefficients for men and women were 3.2 and 0.6 per 100 000, respectively.

A decreasing tendency of oropharyngeal cancer was also identified for both sexes in Cali (Colombia) and Bombay (7) and in Thailand, between 1988 and 1999 (13). The decrease in the latter country was attributed to a decline in smoking rates. The incidence coefficients for men and women were 0.8 and 0.2 per 100 000 inhabitants, respectively (13).

Different results were obtained for the Basque Country between 1986 and 1994. The incidence of oropharyngeal cancer remained stable during this

period, with incidence coefficients of 3.8 and 0.3 per 100 000 inhabitants for men and women, respectively (14). On the other hand, an increasing tendency of oropharyngeal cancer for both sexes was found in Iowa (USA), Norway, Krakow (Poland), Slovenia, Sweden and the Saarland (7).

According to Maciel (8), the risk of cancer increases with age, given that, over time individuals are more exposed to cancerous agents. They are also in agreement the results found in this study for the city of Natal, whose vast majority of mouth and oropharyngeal cancer cases were in individuals over the age of 50 years. In addition, the incidence coefficients of these cancers for the 50-70 and over-70-year age groups were very high.

Even when mouth cancer affects young persons and, although there are new etiological factors for the disease, it is generally observed that most were exposed to traditional risk factors such as smoking, alcohol and low fruit and vegetable consumption (15). In this sense, the epidemiological data in Brazil pertaining to mouth cancer would be more acceptable if there was government action to reduce alcohol and tobacco consumption (16).

Tobacco and alcohol use are considered the main risk factors for oral cancer. Around 33% of Brazilian adults are smokers, according to the National Cancer Institute (INCA) (17), this corresponds to a significant portion of the adult population in the country. It is also known that among individuals who regularly consume alcoholic beverages, the highest prevalence is among smokers (18), indicating a strong interactive effect between tobacco and alcohol.

Despite the importance of alcohol and tobacco in the development of oral cancer, the former has an even greater effect on the etiology of this cancer (19).

The growth in oral cancer in the West is mainly related to the increase in alcohol consumption (20). Adewole (21) also agrees that alcohol is a more influential factor in the development of oral cancer than tobacco smoking, especially in floor of the mouth, tongue and oral mucosal cancers, suggesting that alcohol and tobacco have specific sites in oral cancer etiology.

Another consideration is that the worsening of the morbidity and mortality profiles of oral cancer has occurred in areas of low socioeconomic indicators (22). This is owing to the association between alcohol and tobacco dependency and a larger number of alcoholics in low income individuals (18).

Similarly, different income concentration measures are directly related to health indicators. Low income population groups tend to have precarious oral health conditions, in addition to nutritional deficiencies and are common findings among cases of mouth and pharyngeal cancer (23).

In this perspective, the relation between tobacco and alcohol consumption may not be an adequate explanation for the association between oral cancer and these risk factors, given that the populations from the lower social classes tend to have higher levels of stress, which leads to higher tobacco consumption (24). The etiological factors that have the most influence in oral and pharyngeal cancers vary with the population, as occurs with various chronic diseases and with other types of cancer, and especially determined by life circumstances, social position, and economic, cultural and environmental status (25).

Conclusion

It can be considered that the incidence coefficient levels found in this study are not elevated, both for mouth cancer and oropharyngeal cancer, when compared to the results of other studies. It should also be underscored that mouth cancer exhibits a decreasing tendency in men and oropharyngeal cancer in women. On the other hand, further studies that lead to public policies that can decrease the other series, are urgently needed.

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**Tendencies of oral and oropharyngeal cancer mortality in Natal, Brazil,
between 1980 and 2001**

Tendencies of oral and oropharyngeal cancer mortality

**Paulo Roberto Medeiros de Azevedo ^{a,*}, Maria Angela Fernandes Ferreira
^b, Antonio de Lisboa Lopes Costa ^c**

^a Programa de pós-graduação do Centro de Ciências da Saúde- Universidade Federal do Rio Grande do Norte, Natal, RN. Brazil.

^b Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: angelaf@ufrnet.br

^c Departamento de Odontologia, Universidade Federal do Rio Grande do Norte, Av. Senador Salgado Filho, 1787, Lagoa Nova, Natal, RN. Brazil. E-mail: antoniodelisboa@uol.com.br

* Corresponding author: Tel.: +55-84-3236 3073; fax: +55-84- 3215 3685
Address: Rua Vicente Egberto Cavalcante, 228, Capim Macio, Natal, RN.
Brazil. CEP: 59.082-370. E-mail: prma@ccet.ufrn.br

Abstract

Aim: Describe the mortality coefficients of oral and oropharyngeal cancer and their tendencies in the city of Natal, Brazil, between 1980 and 2001.

Methodology: The data were obtained from the databank of the Subcoordination of Epidemiological Vigilance of the Rio Grande do Norte State Health Secretariat. The simple linear regression model was used for analyses of tendencies. **Results:** The standardized mortality coefficient for oral and oropharyngeal cancers in Natal is 4.0 per 100 000 inhabitants; the standardized coefficients are 2.1 and 6.4 for women and men, respectively. The 50-70 and over-70 year age groups have mortality coefficients of 12.7 and 38.9 per 100 000 inhabitants, respectively. All the series of coefficients analyzed, that is, of the total number of deaths by sex, location (mouth and oropharynx) and age group, have tendencies classified as stable. **Conclusion:** The mortality coefficients of oral cancer in Natal, Brazil are high. We recommend studies with more detailed assessments, mainly of death by oral and oropharyngeal cancer in men and those between the ages of 50 and 70 years, given that their series showed borderline increasing tendencies.

Keywords: Oral cancer; oropharyngeal cancer; mortality; coefficient; tendencies

Introduction

Oral cancer is classified as having one of the ten highest cancer incidences in the world [1] and, despite the evolution of medical technology in recent decades, mortality from this cancer continues to be elevated in most developed countries [2]. In Brazil, the incidence and mortality rates of oral cancer are among the highest in the world and the diagnosis, which is simple to perform given the easy access to the oral cavity, is generally made in the most advanced stages of the disease [3].

In Spain, Nieto and Ramos [4] found age-standardized mortality coefficient for cancers of the tongue, salivary gland, mouth and oropharynx of 6.23 per 100 000 inhabitants in men and 0.83 in women, between 1990 and 1994. This study showed a growing tendency of oral cancer for both sexes in this country.

In Cuba, between 1968 and 1987 mortality from oral cancer exhibited a decreasing tendency [5]. For the period between 1987 and 1996, mortality from oral cancer in this country showed a stable tendency and was three times more frequent in men, corroborating international results [1].

Cancer data in Brazil indicate that oral cancer is a serious public health problem affecting productivity, given that most of the individuals with the disease are in the economically active age group. Mortality rate of oral cancer increased from 1.32 per 100 000 inhabitants in 1979 to 1.82 per 100 000 inhabitants in 1998. During this period the rates for women rose from 0.48 to 0.70 per 100 000 inhabitants, whereas for men they grew from 2.16 to 2.96 per 100 000 inhabitants [6].

In Brazil, Boing et al. [7] identified a stable tendency for the mortality coefficient of oral cancer in both sexes, between 1979 and 2002. In this study, on the other hand, he found an increasing tendency of mortality from oral cancer in the south and northeast regions. Also according to this study, the mortality coefficient of oropharyngeal cancer in Brazil is 0.49 per 100 000 inhabitants, with a tendency classified as growing.

The age-standardized mortality coefficient of oropharyngeal cancer in São Paulo, Brazil, between 1980 and 2002 was 0.60 per 100 000 inhabitants and exhibiting a growing tendency [8]. An increasing tendency for the mortality coefficient of oropharyngeal cancer was also found in Scotland [9], between 1960 and 1989, and in Japan between 1950 and 1994 [10].

The aim of this study was to describe the mortality coefficients of oral and oropharyngeal cancer and their tendencies, according to sex and age group for the city of Natal, Brazil, between 1980 and 2001.

Data source and methods

The mortality data for oral and oropharyngeal cancer in Natal, Brazil were obtained from the databank of the Subcoordination of the Epidemiological Vigilance of the Rio Grande do Norte State Health Secretariat, for the years 1980 to 2001. We observed cancers whose codes in the International Classification of Diseases, 9th Edition (ICD-9), ranged from 141.0 to 146.9 and in the 10th Edition (ICD-10) those whose codes varied between C01.0 and C10.9. The cancers obtained were divided into two types: oropharyngeal (146.9, ICD-9 and C10.9, ICD-10) and the remainder were classified here as

oral cancer. The standardized mortality coefficient was obtained by the direct method using Segi's world population of 1960 as standard. These coefficients were calculated considering both the total number of deaths separately for each sex and age group.

In the temporal series tendency analysis of raw or standardized mortality coefficients, we used the least square method to adjust the simple linear regression model $Y_t = \beta_0 + \beta_1 t + \varepsilon_t$. In this model Y_t is the raw or standardized mortality coefficient, $t = \text{year} - 1990$ and ε_t are non-correlated random errors, with mean zero and constant variance. The assessment of the existence of a tendency in the series was based on the statistical test whose null and alternative hypotheses are $H_0: \beta_1 = 0$ and $H_1: \beta_1 \neq 0$, respectively. That is, the series is considered stable when the null hypothesis is not rejected ($p > 0.05$). If the null hypothesis is rejected ($p < 0.05$), the series is classified as having a rising or falling tendency, depending on whether the signal is positive or negative, respectively, of the estimate obtained for parameter β_1 .

Statistica 7.0 software was used to calculate the mortality coefficients and analyze tendencies.

Results

Between 1980 and 2001, 378 persons died from malignant neoplasias of the mouth and/or the oropharynx in Natal, Brazil. Of this total, 247 (65.3%) were men and 131 (34.7%) were women, that is, a ratio of men to women of 1.9:1. These results correspond to age-standardized mortality coefficients of 6.4 and 2.1 per 100 000 inhabitants for men and women, respectively. The overall

mortality coefficient, also age-standardized, was 4.0 per 100 000 inhabitants. There were 99 deaths from oropharyngeal cancer, accounting for 26.2% of total deaths, 76.8% of whom were men. The remaining locations (oral cancer) amounted to 279 deaths, of which 171 (61.3%) were men and 108 (38.7%) women. Nearly half of the deaths (42.6%) were individuals aged between 50 and 70 years, whereas those under the age of 50 amounted to 17.7%. These data and the mortality coefficients are summarized in table 1, where the standardized coefficient of 6.4 deaths per 100 000 inhabitants in men and the raw coefficient of 38.9 deaths per 100 000 inhabitants in those over the age of 70 years stand out.

Figure 1 shows the tendencies of the series of mortality coefficients of the total number of oral and oropharyngeal cancers of each sex and figure 2 the tendencies of the series of coefficients for all the neoplasias considered and for the oral and oropharyngeal cancers, separately. Figure 3 shows the tendencies of the series of mortality coefficients, according to age group.

The statistics of the historical series shown in figures 1, 2 and 3 are summarized in table 2, with adjustments to the regression models for the series of mortality coefficients. In the adjustments obtained, the p-value of the test on β_1 is identified. These results show that all the series are classified as stable, since a significance level of 5% was considered for the test on β_1 . If, however, a significance level of 10% were considered for the test, the series of standardized mortality coefficients of mouth and oropharyngeal cancer in men would exhibit an increasing linear tendency, given that the estimate of β_1 was positive (0.17) and the p-value of the test on β_1 was 0.091. Analogically, we can

conclude that the series of raw mortality coefficients of oral and oropharyngeal cancer in individuals aged between 50 and 70 years would also display an increasing linear tendency, since the estimate of β_1 in the regression of this series was also positive (0.39) and the p-value of the test on β_1 in this case was 0.068.

Discussion

There is currently great concern about the growing tendency of oral cancer in developed countries, particularly in the population of young men in these countries [11, 12].

In this study the mortality coefficient of overall oropharyngeal cancer in Natal was higher than in many developed countries [4, 13] and more than twice that obtained for Brazil between 1979 and 2002 [7].

Cancer Research UK [13] reports that the age-adjusted mortality coefficient in the United Kingdom in 2003 was 2.2 per 100 000 inhabitants and, according to Stewart and Kleihues [14], it is estimated that oral and pharyngeal tumors account for around 200 000 deaths per year worldwide.

During the 1980s and 1990s in Brazil there was an increase in oral cancer mortality [7]. Similarly, oropharyngeal cancer has one of the highest mortality rates among all the neoplasias [15].

When mortality distribution is matched to sex, a much higher percentage of deaths in men can be observed. When compared to the findings of Nieto and Ramos [4], the mortality coefficient for men found in our study was at the same level as that obtained in Spain, whereas for women between 1980 and 2001,

the mortality coefficient for Natal was nearly 2.5 times that found in Spain for the period between 1990 and 1994.

In the United Kingdom [13] the mortality coefficients for men and women were 3.3 and 1.4 per 100,000 inhabitants, respectively. That is, values well below those obtained in our study for Natal between 1980 and 2001.

The most worrisome aspect is the growing mortality tendency. Although no statistical significance was found, if we consider a significance level of 10% for the test on β_1 of the model for the series of standardized mortality coefficients of mouth and oropharyngeal cancer in men, this series would exhibit an increasing linear tendency, since the p-value obtained was 0.0911.

Similarly, for deaths between the ages of 50 and 70 years, the series of mortality coefficients for this age range would also display an increasing linear tendency, if the significance level were 10% for the test on β_1 of the model for this series. That is, in addition to the high levels obtained, the existence of a growing tendency for these coefficients is practically confirmed.

Several studies in Brazil indicate increased mortality from oral cancer in older individuals and this growth may be aggravated by the aging process of the Brazilian population.

Even when oral cancer affects young persons and, although there are new etiological factors for the disease, it is generally observed that most were exposed to traditional risk factors such as smoking, alcohol and low fruit and vegetable consumption [16]. In this sense, the epidemiological data in Brazil pertaining to oral cancer would be more acceptable if there was government action to reduce alcohol and tobacco consumption [7].

The above analysis shows that much more needs to be done to control alcohol and tobacco consumption, given that these are considered the main risk factors of oral cancer. According to the National Cancer Institute (INCA), nearly 33% of Brazilian adults smoke; this represents a significant portion of the adult population. It is also known that among individuals who regularly consume alcoholic beverages, the highest prevalence is among smokers [17], indicating a strong interactive effect between tobacco and alcohol.

Another consideration is that the worsening of the morbidity and mortality profiles of oral cancer has occurred in areas of low socioeconomic indicators [18]. This is owing to the association between alcohol and tobacco dependency and a larger number of alcoholics in low income individuals [17].

Similarly, different income concentration measures are directly related to health indicators [19]. Low income population groups tend to have precarious oral health conditions, in addition to nutritional deficiencies, which are common findings among cases of mouth and pharyngeal cancer.

In this perspective, the relation between tobacco and alcohol consumption may not completely explain the association between oral cancer and these risk factors, given that the populations from the lower social classes tend to have higher levels of stress, which leads to higher tobacco consumption [20].

Another aspect related to health care, given that the high mortality rates of this cancer are associated mainly the lack of early diagnosis [21]. Although oral cancer can be prevented and is easily detected in its early stages, in Brazil this cancer has not received sufficient attention from either the population or health professionals [3].

Given that oral cancer is classified as one of the 8 main causes of cancer deaths in Brazil, studies that accurately describe the factors related to its prevalence are urgently needed [22]. Similarly, knowledge of incidence and mortality is crucial for preventing and controlling oral cancer, by favoring planning, assessment and follow up of activities that aim at altering the epidemiological profile of this disease [6].

Conclusion

In addition to the high levels of mortality coefficients found in this study, both overall and by sex, location and age group, the series of standardized mortality coefficients of oral and oropharyngeal cancer (jointly) of men and those aged between 50 and 70 years are practically classified as having a growing tendency. This suggests the need for studies that further assess these phenomena and that recommend public policies able to alter the reality found in this work.

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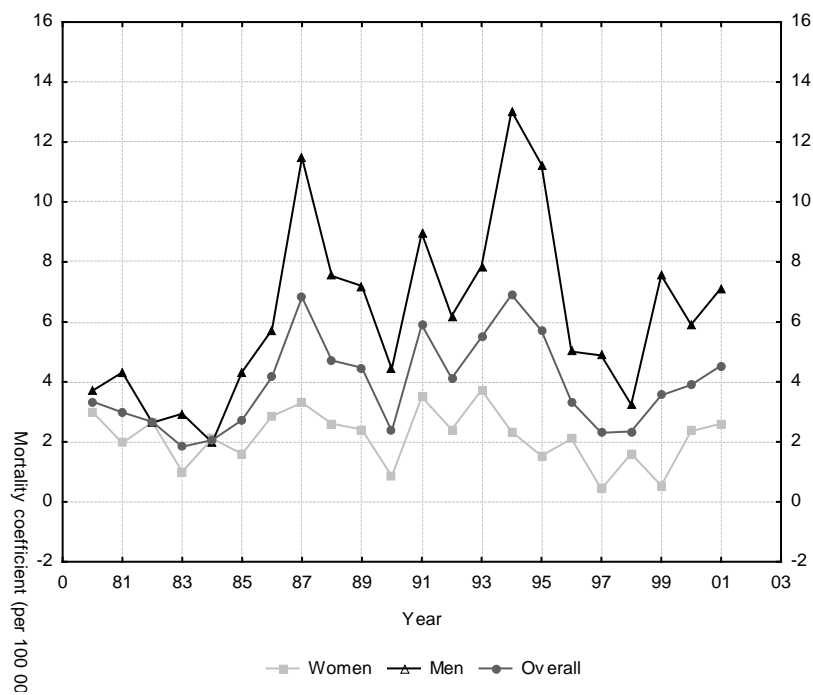


Figure 1: Standardized mortality coefficients for the total of oral and oropharyngeal cancers, according to sex, in Natal, Brazil, between 1980 and 2001.

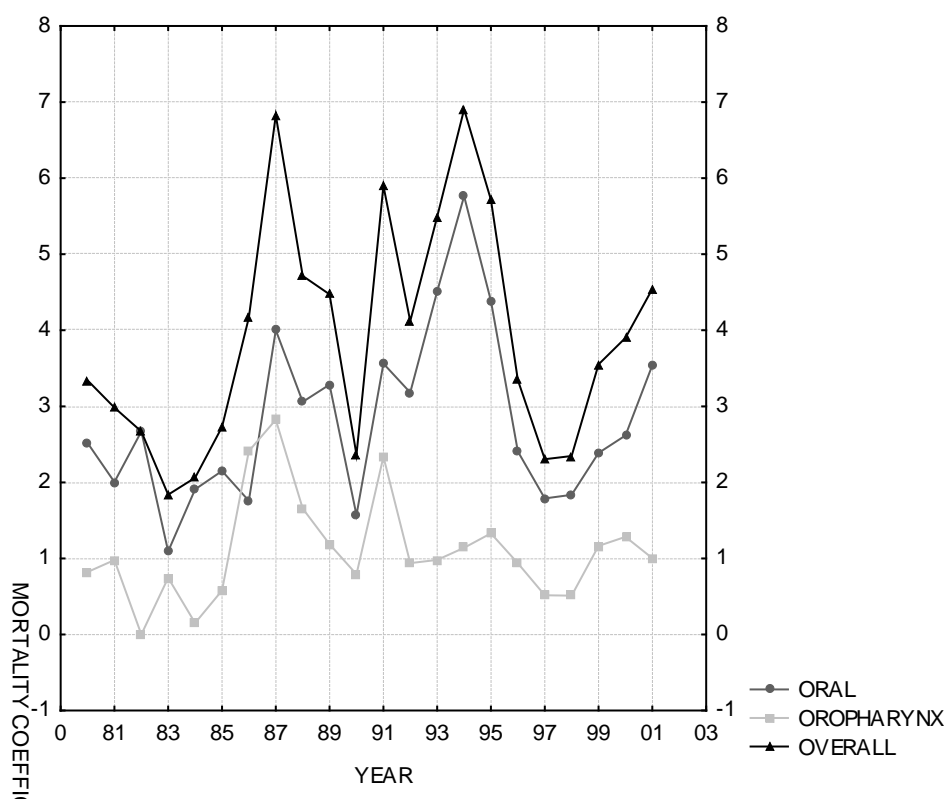


Figure 2: Standardized mortality coefficients for all the neoplasias and for the oral and oropharyngeal cancers, in Natal, Brazil, between 1980 and 2001.

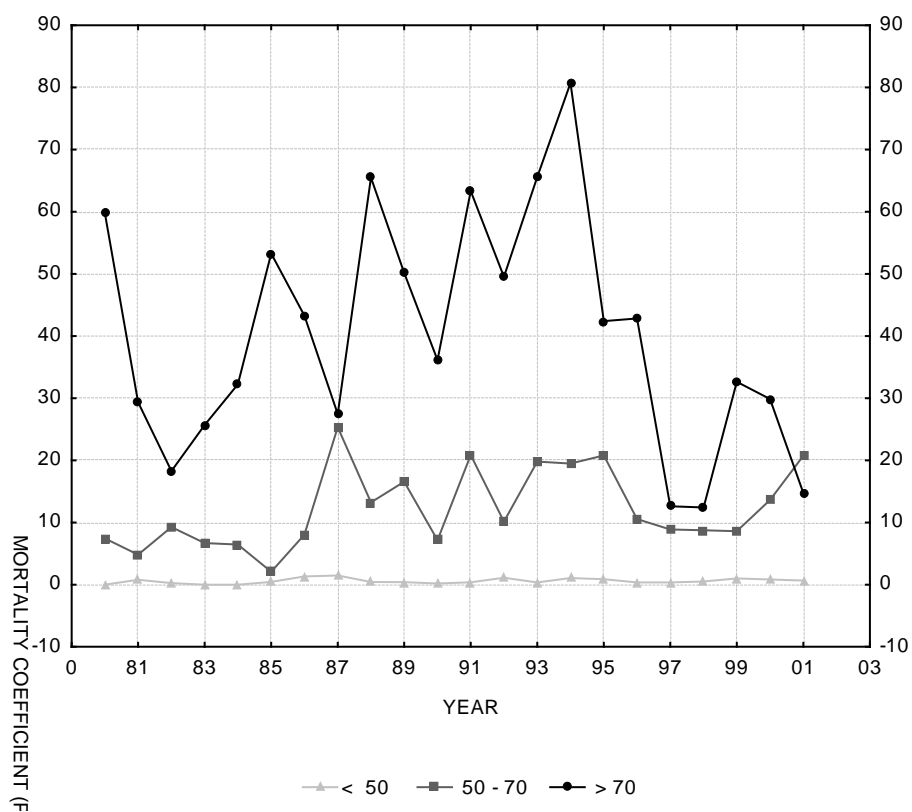


Figure 3: Raw mortality coefficients of oral and oropharyngeal cancers, according to age group, in Natal, Brazil, between 1980 and 2001.

Table 1: Distribution of the number and percentage of deaths and the mortality coefficients of oral and oropharyngeal cancer, by sex, location and age group, in Natal, Brazil, between 1980 and 2001.

Variable	Deaths		Mortality coefficient (per 100 000)
	N ^o	%	
sex			
female	131	34.7	2.1
male	247	65.3	6.4
location			
mouth	279	73.8	2.9
oropharyngeal	99	26.2	1.1
age group (years)			
< 50	67	17.7	0.6
50 - 70	161	42.6	12.7
> 70	150	39.7	38.9

Table 2: Tendency analysis of oral and oropharyngeal cancer mortality coefficients, according to sex, location and age group, in Natal, Brazil, between 1980 and 2001.

Variable	Estimated model	p	Tendency
total	$3.90 + 0.05(\text{year} - 1990)$	0.2987	stable
sex			
female	$2.18 - 0.03(\text{year} - 1990)$	0.3251	stable
male	$6.16 + 0.17(\text{year} - 1990)$	0.0911	stable
location			
mouth	$2.79 + 0.048(\text{year} - 990)$	0.2126	stable
oropharyngeal	$1.10 + 0.006(\text{year} - 1990)$	0.8065	stable
age group (years)			
< 50	$0.57 + 0.02(\text{year} - 1990)$	0.1927	stable
50 – 70	$12.04 + 0.39(\text{year} - 1990)$	0.0684	stable
> 70	$40.60 - 0.49(\text{year} - 1990)$	0.4562	stable

4. COMENTÁRIOS, CRÍTICAS E CONCLUSÕES

A partir do anteprojeto inicial foi gerado, para pacientes com câncer de boca e de orofaringe em Natal(RN):

- ✓ Estimativa da probabilidade acumulada de sobrevida segundo sexo, faixa etária, ano do diagnóstico (de 1997 a 2001), grupo de diagnóstico e localização (boca ou orofaringe);
- ✓ Ajuste do modelo de regressão de Cox segundo faixa etária, sexo, morfologia e localização, com base em registros de base populacional, de 1997 a 2001;
- ✓ Descrição dos coeficientes de incidência e análises das tendências desses coeficientes segundo sexo e faixa etária;
- ✓ Descrição dos coeficientes de mortalidade e análises das tendências desses coeficientes segundo sexo e faixa etária.

Dificuldades da metodologia:

Inicialmente foi prevista a realização de análise de agrupamento de regiões de Natal, de acordo com os coeficientes de incidência dos cânceres de boca e de orofaringe. Além desta, também foram previstas análises estatísticas de associação, através do teste qui-quadrado, e de perfil, considerando subpopulações definidas pelas variáveis sexo, cor e faixa etária. Para esta última análise seria necessário um número de observações bem maior do obtido no estudo (de 1997 a 2001), visto que a técnica de análise de perfil supõe normalidade na distribuição das variáveis a serem consideradas, que neste caso seriam: localização, extensão e tipo histológico. Associações através do

teste qui-quadrado não foram feitas dado que as análises realizadas no estudo já contemplam de alguma forma relações entre variáveis constantes no Registro de Câncer de Base Populacional (RCBP). A análise de agrupamento de regiões de Natal deixamos para ser objeto de um artigo que pretendemos escrever logo após a apresentação do trabalho, até aqui concluído. Basicamente são duas as razões de deixarmos o referido artigo para um momento subsequente: a provável obtenção de ao menos mais um ano a mais de observações no RCBP e pouco espaço de tempo para juntar essa análise com aquelas já concluídas até este momento.

Mérito, originalidade e contribuição

A probabilidade acumulada de sobrevida após 5 anos de pacientes com câncer de língua tem permanecido praticamente constante em todo o mundo, desde o início dos anos 70. Nos países desenvolvidos essa taxa encontra-se em torno de 50%.^{9,10,11} Segundo Sugerman and Savage,¹² para o câncer intraoral (língua, gengiva, assoalho da boca e outras e não especificadas partes da boca), a taxa acumulada de sobrevida após 5 anos é menor que 50%, principalmente para os casos em que ocorre metástase. Muitos fatores relacionados ao paciente, ao tumor e a tratamentos têm sido identificados na predição da sobrevida de pacientes com câncer de língua.^{9,13,14}

Através da análise da incidência de câncer pode-se avaliar como a prevenção preliminar afeta as taxas e a distribuição da doença em populações

específicas devido a mudanças em comportamento de risco. Esta é uma característica importante da avaliação de séries históricas de incidência e de mortalidade na realização do monitoramento completo do câncer em localidades específicas (Latorre e Cardoso).¹⁵ Para Silva et al.,⁴ o conhecimento da incidência e da mortalidade é essencial para prevenir e controlar o câncer de boca, de forma a favorecer o planejamento, avaliação e acompanhamento de atividades que visem reverter o perfil epidemiológico dessa doença.

Foram analisados dados sobre câncer de boca e de orofaringe do registro de câncer do município de Natal (RN) (implantado em 1997), de forma que não há registro de trabalho para a cidade de Natal (RN) sobre as análises estatísticas de sobrevida e de tendência dos coeficientes de incidência dos referidos cânceres, tal como realizamos neste estudo. Da mesma forma, também não se encontra registro de nem um trabalho tratando de análises de tendência dos coeficientes de mortalidade pelos cânceres de boca e de orofaringe em Natal (RN).

As análises dos cânceres de boca e de orofaringe em Natal (RN), realizadas neste estudo, indicam:

- ✓ Uma baixa taxa de sobrevida após 5 anos, quando comparada com os resultados de alguns outros estudos;

- ✓ Não há melhora no prognóstico com o passar dos anos;

- ✓ Os pacientes com câncer de boca apresentam menos risco de morte do que aqueles com câncer de orofaringe, independentemente dos fatores considerados neste estudo;

- ✓ Também de forma independente dos demais fatores considerados neste estudo, a neoplasia maligna indiferenciada tem risco de morte maior do que o

carcinoma epidermóide, cujos achados mundiais é o tipo histopatológico predominante;¹⁶

✓ Não estão elevadas as magnitudes dos coeficientes de incidência, tanto para o câncer de boca como para o câncer de orofaringe, quando comparadas com os resultados de outros estudos;

✓ São classificadas com tendência decrescente as incidências do câncer de boca, para o gênero masculino, e do câncer de orofaringe, para o gênero feminino;

✓ São elevadas as magnitudes dos coeficientes de mortalidade, tanto no total, como por gênero, por localização e por faixa etária;

✓ A necessidade de outros estudos com avaliações que indiquem políticas públicas que possam de alguma forma reverter a realidade de alguns dos resultados encontrados neste trabalho.

Registro de Câncer de Base Populacional de Natal (RN)

O Registro de Câncer de Base Populacional (RCBP) de Natal foi criado em 1996, junto à Secretaria de Saúde do Estado do Rio Grande do Norte e instalado sob a orientação do Ministério da Saúde, de forma que iniciou o funcionamento em 1997 e somente em janeiro de 2010 é que este registro havia consolidado os dados referentes ao ano de 2002.

Como um registro de base populacional, o RCBP coleta e processa todos os casos novos de câncer do município de Natal surgidos no decorrer de cada ano. Esses casos incluem todos os tumores classificados como malignos,

invasivos ou in situ. Para serem elegíveis, os diagnósticos de câncer em tais pacientes devem apresentar data posterior à fixação de suas residências nesta cidade.

As fontes de informações investigadas pelo RCBP compreendem laboratórios de patologia clínica e hematologia, centros de diagnóstico, hospitais públicos, privados e filantrópicos, e a Divisão de Morbi-Mortalidade da Secretaria Estadual de Saúde.

Sabe-se que a operacionalização e manutenção dos registros de câncer de base populacional exigem grandes investimentos do setor público, sendo necessária uma soma de esforços para que os mesmos possam realizar seu trabalho da melhor forma possível, dado o auxílio no planejamento e estabelecimento de programas de prevenção e tratamento que o conhecimento das estatísticas sobre as neoplasias podem propiciar.

Na coleta de dados são registradas informações sobre o paciente, a data do diagnóstico, o meio de diagnóstico, a topografia, a morfologia e o comportamento do tumor (Anexo). Conforme se observou, no entanto, para algumas dessas informações, como a extensão da doença, por exemplo, os dados ainda deixam a desejar, na medida em que em muitos dos registros o campo sobre a ocorrência ou não de metástase não encontra-se devidamente preenchido.

Enriquecimento intelectual e científico

Para a realização da análise de sobrevida dos pacientes com câncer de boca e de orofaringe em Natal precisei estudar as técnicas de análise de sobrevivência, utilizando principalmente os livros “Análise de Sobrevivência Aplicada”¹⁷ e “Análise de sobrevida (Teoria e Aplicações em Saúde)”¹⁸, resultando conseqüentemente em enriquecimento intelectual e científico. É importante também destacar o aprendizado da consulta, crítica e elaboração do artigo científico. Indiscutivelmente isto é muito enriquecedor cientificamente, sendo fundamental para as pessoas que atuam (ou que atuarão) em atividades acadêmicas.

Metas atingidas e outras a serem alcançadas

A idéia inicial para este trabalho era exatamente como o mesmo se encontra, ou seja, uma análise de sobrevida dos pacientes com câncer de boca e de orofaringe em Natal e análises de tendências dos coeficientes de incidência e de mortalidade por estes cânceres. Além da clara importância destas análises, esta idéia fundamentou-se também no fato de que este tipo de trabalho já vem sendo realizado em algumas capitais brasileiras, para outros tipos de câncer. Em seguida acrescentamos outras metas, conforme já citamos no parágrafo “Dificuldades da metodologia”. Dessas outras, estamos com o compromisso de

escrever um artigo sobre a análise de agrupamento de regiões de Natal, de acordo com os coeficientes de incidência dos cânceres de boca e de orofaringe. Para esta análise estamos aguardando a consolidação, pelo RCBP de Natal, dos dados referentes aos anos de 2002 e 2003.

Cumprimento do cronograma

Conforme nosso planejamento, a redação final do trabalho seria feita no segundo semestre de 2007. Acontece que só conseguimos os dados do RCBP no final do primeiro semestre de 2008. Por outro lado, tínhamos imaginado inicialmente que poderíamos dar alguma contribuição no trabalho de digitação dos referidos dados, utilizando inclusive a participação de algum aluno bolsista. No entanto, isto não foi possível, por se tratar de um trabalho muito específico da equipe do RCBP. Com esse atraso, no final do segundo semestre de 2008 foi possível concluir a redação dos três artigos que compõem nosso trabalho.

Participação em grupo de pesquisa

Pertenço a base de pesquisa “Alimentos, Nutrição e Saúde“, do Departamento de Nutrição da UFRN, coordenada pela professora Lúcia de Fátima Campos Pedrosa. Neste grupo, participei das análises estatísticas de artigos (ainda serão enviados para revistas) das teses das alunas do doutorado

do Centro de Ciências da Saúde Clélia de Oliveira Lyra e Severina Carla Vieira Cunha Lima, cujos respectivos títulos são: “Body Mass Index, Body Fat and Central Obesity associated with High Blood Pressure in Adolescents” e “Dislipidemia e estado nutricional como fatores de risco para doenças cardiovasculares em adolescentes”.

Também participo dos seguintes projetos:

- ✓ Análise do Perfil Epidemiológico da Infecção por HPV na População Feminina do estado do Rio Grande do Norte, cuja coordenação é do professor José Veríssimo Fernandes, lotado no Departamento de Microbiologia e Parasitologia do Centro de Biociências da UFRN;

- ✓ Estudo de Prevalência da infecção por HPV em mulheres de uma comunidade com alta frequência de lesões da cérvix uterina, coordenado pelo professor José Veríssimo Fernandes, lotado no Departamento de Microbiologia e Parasitologia do Centro de Biociências da UFRN;

- ✓ Desenvolvimento e Avaliação de Novos Métodos Moleculares para o Diagnóstico da Dengue no Estado do Rio Grande do Norte, coordenado pelo professor Joselio Maria Galvão de Araújo, lotado no Departamento de Microbiologia e Parasitologia do Centro de Biociências da UFRN;

- ✓ Avaliação da doença de Chagas por parâmetros sorológico, parasitológico e molecular no oeste potiguar, cuja coordenação é da professora Antonia Cláudia Jacome da Câmara, lotada no Departamento de Microbiologia e Parasitologia do Centro de Biociências da UFRN;

- ✓ Avaliação do conhecimento popular e das práticas em saúde bucal empregados pela população atendida pelo Programa de Saúde da Família do município de Caicó/RN. Este projeto é coordenado pela professora Maria de

Lourdes Silva de Arruda Morais, da Universidade Estadual do Rio Grande do Norte, Campus de Caicó/RN;

✓ Estou ainda integrando a equipe do projeto “O risco de malignidade associado à radiação natural: Avaliação e Diagnóstico do Agente Carcinogênico nas Águas de Fontes de Abastecimentos e nas Atmosferas de Habitações e locais de Trabalho no município de Natal/RN”, coordenado pelo professor Thomas Ferreira da Costa Campos – Departamento de Geologia – UFRN.

Particpei das análises estatísticas dos seguintes trabalhos de pós-graduação:

1- Dissertações já apresentadas

a) Coeficiente de incidência da dengue e sua relação com os diferenciais intra-urbanos segundo condições de vida no município do Natal, Rio G. Norte

Mestranda: Maria Cristiana da Silva Souto

Orientadora: Profa. Dra. Raquel Franco de Souza Lima

Pós-graduação: Programa Regional de Pós-Graduação em Desenvolvimento e Meio Ambiente da Universidade Federal do Rio Grande do Norte (PRODEMA/UFRN)

Apresentação: 2006;

b) Recidiva de câncer labial em pacientes atendidos no Hospital Dr. Luiz Antonio (Natal-RN), entre 1997 e 2004.

Mestranda: Marina Fernandes de Sena

Orientadora: Prof^a Dr^a Maria Angela Fernandes Ferreira

Pós-graduação: Pós-graduação em Odontologia, área de concentração
Odontologia Preventiva e Social
Apresentação: 2008

2- Dissertação ainda não apresentada

Ocorrência de insetos vetores em bairros adjacentes a ZPAs e sua
relação com indicadores de desenvolvimento sustentável em Natal –
RN.

Mestrando: Paulo Sérgio Fagundes Araújo

Orientadora: Profa. Dra. Maria de Fátima Freire de Melo Ximenes

Pós-graduação: Programa Regional de Pós-Graduação em
Desenvolvimento e Meio Ambiente da Universidade Federal do Rio
Grande do Norte (PRODEMA/UFRN);

3- Tese ainda não apresentada

Tumores de glândulas salivares maiores e menores: análise
clinicopatológica

Doutoranda: Maria de Lourdes Silva de Arruda Moraes

Orientador: Prof. Dr. Antonio de Lisboa Lopes Costa

Pós-graduação: Programa de Pós-graduação em Ciências da Saúde.

Além das atividades acima citadas, tive a oportunidade de participar das análises estatísticas de quatro artigos já publicados e outros dois aceitos para publicação:

1- Artigos publicados

- a) Prevalência de transtornos mentais comuns e avaliação da qualidade de vida no climatério (2007) - Revista da Associação Médica Brasileira;
- b) Human papillomavirus infection in women attended at a cervical cancer screening service in Natal, Brazil (2008) – Brazilian Journal of Microbiology;
- c) Prevalence of HPV infection by cervical cytologic status in Brazil (2009) – International Journal of Gynecology and Obstetrics;
- d) Assesment of personal hygiene and practices of food handlers in municipal public schools of Natal, Brazil (2009) – Food Control.

2- Artigos aceitos para publicação

- a) Conhecimentos, atitudes e práticas do exame de Papanicolau entre mulheres de São José de Mipibú – RN (2009) – Revista de Saúde Pública;
- b) Seasonal variation of potential flavivirus vectors in an urban biological reserve in Northeastern Brazil (2009) – Journal of Medical Entomology.

Pretensão de constituir uma base de pesquisa

Dada a importância da descrição dos coeficientes de mortalidade e de incidência de alguns cânceres, bem como das tendências desses coeficientes e da análise de sobrevivência, temos a idéia de constituir uma base de pesquisa para realizar esses tipos de estudo para outros cânceres, utilizando dados do Registro de Câncer de Base Populacional de Natal/RN.

5. ANEXO

Ministério da Saúde Secretaria de Saúde Pública / RN Instituto Nacional de Câncer INCA / Pro-Onco		Sistema U. de Saúde SUS RN	
Registro de Câncer de Base Populacional de Natal			
			Nº do registro na fonte <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Nome completo do paciente _____ _____			
Nome da mãe _____ _____			
Sexo <input type="text"/> 1 <input type="text"/> Masculino <input type="text"/> 2 <input type="text"/> Feminino		Data de nascimento / Idade ____ / ____ / ____	
Cor <input type="text"/> 1 <input type="text"/> Branca <input type="text"/> 2 <input type="text"/> Negra <input type="text"/> 3 <input type="text"/> Parda <input type="text"/> 4 <input type="text"/> Amarela			
<input type="text"/> 9 <input type="text"/> Ignorada			
Residência/ Procedência _____			<input type="text"/> <input type="text"/> <input type="text"/>
Profissão _____			<input type="text"/> <input type="text"/> <input type="text"/>
Fonte da notificação _____			<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Topografia: (localização) _____			<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Morfologia: (tipo histológico) _____			<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Meio de diagnóstico: <input type="text"/> 1 <input type="text"/> Histológico <input type="text"/> 5 <input type="text"/> Clínico <input type="text"/> 2 <input type="text"/> Citológico <input type="text"/> 6 <input type="text"/> Necropsia <input type="text"/> 3 <input type="text"/> Cirúrgico <input type="text"/> 7 <input type="text"/> Outros <input type="text"/> 4 <input type="text"/> Raio X <input type="text"/> 9 <input type="text"/> Ignorado		Extensão: <input type="text"/> 1 <input type="text"/> Localizado <input type="text"/> 3 <input type="text"/> Metástase <input type="text"/> 2 <input type="text"/> Metástase a distância regional <input type="text"/> 9 <input type="text"/> Ignorado	
Data do diagnóstico Data do Óbito ____ / ____ / ____ ____ / ____ / ____		Registrador _____	
Observação vide verso: <input type="checkbox"/>			

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6. ABSTRACT

Introduction: Mouth cancer is classified as having one of the ten highest cancer incidences in the world. In Brazil, the incidence and mortality rates of oral cancer are among the highest in the world. Intraoral cancer (tongue, gum, floor of the mouth, and other non-specified parts of the mouth), the accumulated survival rate after five years is less than 50%. **Objectives:** Estimate the accumulated survival probability after five years and adjust the Cox regression model for mouth and oropharyngeal cancers, according to age range, sex, morphology, and location, for the city of Natal. Describe the mortality and incidence coefficients of oral and oropharyngeal cancer and their tendencies in the city of Natal, between 1980 and 2001 and between 1997 and 2001, respectively. **Methods:** Survival data of patients registered between 1997 and 2001 was obtained from the Population-based Cancer Record of Natal. Differences between the survival curves were tested using the log-rank test. The Cox proportional risk model was used to estimate risk ratios. The simple linear regression model was used for tendency analyses of the mortality and incidence coefficients. **Results:** The probability after five years was 22.9%. The patients with undifferentiated malignant neoplasia were 4.7 times more at risk of dying than those with epidermoid carcinoma, whereas the patients with oropharyngeal cancer had 2.0 times more at risk of dying than those with mouth cancer. The mouth cancer mortality and incidence coefficients for Natal were 4.3 and 2.9 per 100 000 inhabitants, respectively. The oropharyngeal cancer mortality and incidence coefficients were, respectively, 1.1 and 0.7 per 100 000

inhabitants. **Conclusions:** A low survival rate after five years was identified. Patients with oropharyngeal cancer had a greater risk of dying, independent of the factors considered in this study. Also independent of other factors, undifferentiated malignant neoplasia posed a greater risk of death. The magnitudes of the incidence coefficients found are not considered elevated, whereas the magnitudes of the mortality coefficients are high.

Keywords: Mouth cancer; oropharyngeal cancer; survival; incidence; mortality; tendencies.

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