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MORTALITY FROM ORAL AND OROPHARYNGEAL CANCER IN BRAZIL, 2002 -2011

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ABSTRACT:

For the World Health Organization (WHO), oral and oropharyngeal cancers are the most frequent neoplasms of the head and neck. In Brazil, recent studies show a high number of deaths from oral and oropharyngeal cancers. The aim of this study was to investigate the deaths from oral and oropharyngeal cancers that occurred in Brazil between 2002 and 2011. It was a retrospective observational study that used data from Brazilian Mortality Information System (SIM). The variables used for descriptive statistics were gender, color / race, age, education, place of occurrence, civil status and underlying cause of cancer of the mouth and oropharynx (Category C00 to C14). Death rates between 2002 and 2011 were calculated to analyze the mortality trends. To assess the level of health, the mortality curve (Nelson de Moraes) and the Proportional Mortality Ratio (PMR) plus Swaroop and Uemura Index were built. In Brazil, 60.132 deaths from oral and oropharyngeal cancers have occurred. Being prevalent in white men over 50 years, with little education, married and whose deaths occur in a hospital setting. The PMR found for age 50 and older was 81.68% (1st level). There was a trend growth rate of mortality for categories C01 (base of tongue), C10 (oropharynx) and the sum of the categories C00 to C14. The others remained stable for the period studied. There was an increase in the rate of deaths from cancer of the mouth and oropharynx between 2002 and 2011. Though the PMR observed showed a high level of death in older people. Deaths and ill-defined NE hinder the knowledge of the true mortality from oral and oropharyngeal cancers.

Keywords: Epidemiology, Mouth Neoplasms, Mortality Rate, Oropharyngeal Neoplasms, Cancer.

INTRODUCTION:

The process of modification of the health-illness standards, known as epidemiological transition, is characterized by the change in the profile of mortality with the increase of the tax of chronic degenerative illnesses, in special cardiovascular diseases and cancer [1].

According to the Brazilian National Institute of Cancer (INCA), the estimate is about 580 in a thousand new cases of cancer in 2014. For oral cancer, it occupies the fifth general place in the masculine population [2].

Oral cancer had its increased prevalence, mainly, in people in the age of 60 years with significant tax of mortality [3]. It is a multifactorial neoplasia and the main factors of risk are: tobacco, alcohol, mechanical trauma, biological agents, genetic predisposition and general health status

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state of individuals [3,4]. Studies have shown that rich diets in fruits and vegetables are protective factors against oral cancer [5,6].

For the World Health Organization (WHO), the oral and oropharyngeal cancers are the types of neoplasms most frequent of the head and neck [7]. The Brazilian regions; Southeastern and South are characterized for showing the biggest oral cancer mortality rates [2,8].

Oral and oropharynx mortality studies are important for prevention actions, planning, early diagnosis and mortality reduction of these types of cancer. In this direction, to know the magnitude of the prevalences, stratification for age, sort and the standard of mortality for oral cancer in Brazil they had motivated the accomplishment of the present communication.

The objective of this study is to analyze the oral and oropharyngeal cancer deaths registered in Brazil between 2002 and 2011.

MATERIALS AND METHODS:

This is an observational study with a descriptive source of secondary data. The data were extracted from the Brazilian Mortality Information System (SIM)[9]. It is an information system that captures mortality data from Brazil[9]. The default document of SIM is the Death Declaration (DD), used by notaries public for issue of Certificate of Death. The data are collected by municipal health departments, where they are reviewed, coded, corrected and processed.

The SIM makes the data available through the publicly DATASUS site and to all levels of the health system (state and local federal) [9]. The criteria adopted for the collection of SIM data were: The data collected by the researchers were collected in duplicate with an interval of 30 days between collections. This procedure was carried out at different times to ensure that there was no double inclusions or any exclusion of records and ensures the quality of the data as the two database systems are fed constantly and continuously. The data are available on the SIM by the year 2012 and is subject to correction by the system. This fact prevented the inclusion of 2012 data, 2013, 2014, 2015 and compromise the research.

For this publishing, the variables used were gender, skin color, age, education, place of occurrence, marriage, underlying cause of oral and oropharyngeal cancer deaths. The selection of anatomical regions of origin of the tumors was based on Chapter 2 (neoplasms) of International Classification of Diseases (ICD-10) and C00 to C14 categories [10]. The data extracted from SIM were organized in relative and absolute frequency tables to perform the descriptive statistics. To analyze the oral and oropharyngealcancer mortality rates, graphs of mortality rates were built with data from 2002 to 2011. To calculate the

mortality rate, the Brazilian population was used as reference with a population count from 2002 to 2011 and for 2010 we used the 2010 Brazilian Census [11].

Brazil is the largest national economy in Latin America, the world's eight largest economy [11].According to the Brazilian Institute of Geography and Statistics (IBGE), 48.43% of the population (about 92 million) described themselves as White; 43.80% (about 83 million) as Pardo (brown), 6.84% (about 13 million) as Black; 0.58% (about 1.1 million) as Asian; and 0.28% (about 536 thousand) as Amerindian (officially called *indígena*, Indigenous), while 0.07% (about 130 thousand) did not declare their race [11]. The Brazilian public health system, the National Health System (SUS), is managed and provided by all levels of government. The public health services are universal and available to all citizens of the country for free. Nevertheless, millions of affluent Brazilians have private health care coverage [11].

In order to evaluate the health status of Brazilian population, the proportional mortality curve called Nelson de Moraes curve and the Proportional Mortality Ratio (PMR) also called Swaroop and Uemura Index were built. The proportional mortality curves are constructed from the proportional distribution of deaths by age groups with respect to total deaths for a specific population and these distributions exhibit certain graphical format, which indicate the health status of the population area [12]. Since the PMR is the proportion of individuals' deaths equal or higher than 50 years compared to total deaths [12].

RESULTS:

In the period, 60.132 oral and oropharyngeal cancer deaths ocurred. Being prevalent in men, whites, of more than 50 years, low schooling, married and whose death occurred in hospitals. (Table 1). The PMR for age of 50 years or more was 81.68% and indicates that approximately four out of five deaths were in people aged 50 years or more. According to classification of the level of health of the population of the Swaroop and Uemura Index that is greater than or equal to 75% is typical of developed country of first level. [Table 1].

Table 1. Mortality characterization for oral and oropharyngeal cancer (ICD-10 categories - C00 to C14), Brazil, 2002 to 2011

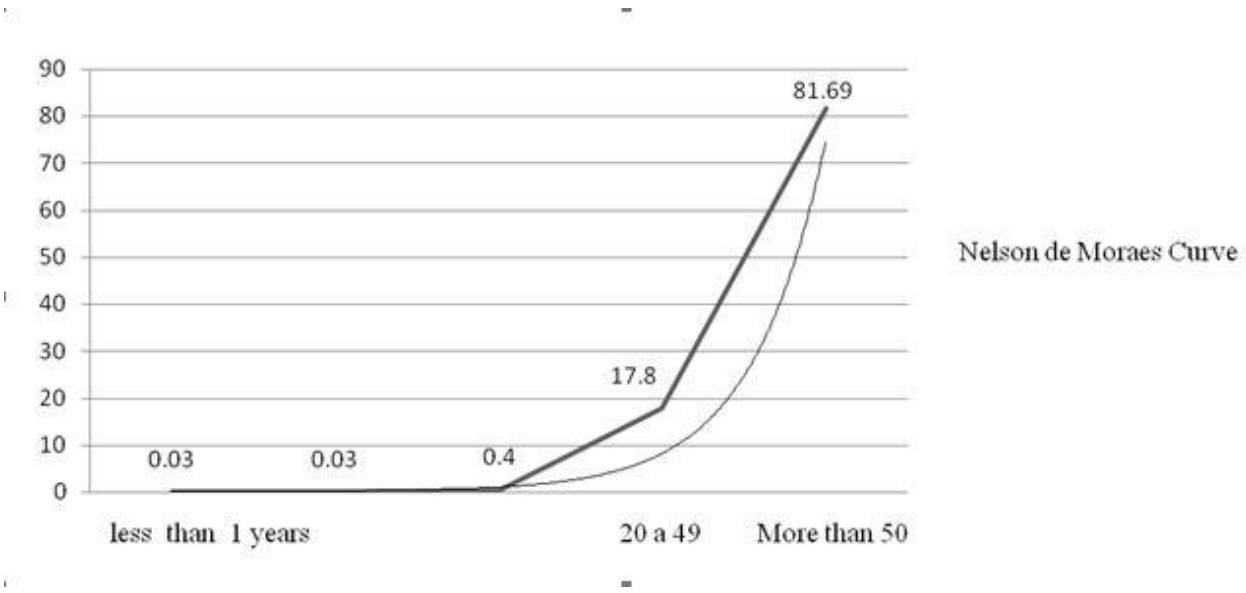
Variables	Prevalence	%
Sex		
Male	47.990	79,81
Female	12.141	20,19
Unknown	1	0,001
Total	60.132	100
Skin Color		
White	34.914	58,06

Black	4.784	7,95
Yellow	270	0,45
Brown	16.212	26,96
Indigenous	41	0,06
Unknown	3.911	6,50
Age in years		**(PMR)**[I]
Less than 1	18	0,03
1 a 4	19	0,03
5 a 19	242	0,40
20 a 49	10.704	17,80
More than 50	49.117	81,68[II]
Unknown	32	0,05
Educational level (years)		
None	8.068	13,42
1 a 3	13.330	22,17
4 a 7	12.701	21,12
8 a 11	5.281	8,78
More than12	2.449	4,07
Unknown	18.303	30,44
Place of Death		
Hospital	43.082	71,64
Health services	1.358	2,26
Residence	14.741	24,51
Thoroughfare	187	0,31
Others	675	1,12
Unknown	89	0,14
Marital Status		
Single	14.941	24,84
Married	28.174	46,85
Widowed	8.472	14,08
Divorced	4.947	8,22
Other	341	0,56
Unknown	3.257	5,41

Supply: (SIM)
(I) Proportional Mortality Ratio (PMR)
(II) Swaroop e Uemura Índex

The health level represented by the variation of the proportional mortality curve indicates, according to classification of Nelson de Moraes, predominance of the proportion of deaths of people with more advanced ages type IV: high health level. [Figure 1].

Figure 1. Proportional Mortality Ratio (PMR) and Nelson de Moraes curve for mortality characterization for oral and oropharyngeal cancers, Brazil, 2002 to 2011



Regarding the category of injury, it may be affirmed that in 27,513 (45.76%) deaths, the source location of the lesion (C02, C06, C08 and C14) could not be identified. Of the mouth, the greatest frequencies were the base of the tongue (C01), palate (C05) and the floor of the mouth (C04). [Table 2].

Table 2. Mortality frequence from oral and oropharyngeal cancer by ICD-10 category, Brazil, 2002-2011

ICD-10 category	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total (%)
C00 Lip	44	46	41	38	37	54	48	45	48	58	459 (0,76)
C01 Tongue base	290	303	318	342	278	343	381	431	408	454	3.548 (5,90)
C02 Others unspecified parts of tongue	678	748	739	767	811	876	883	914	907	951	8.274 (13,76)
C03 Gum	34	35	28	38	38	35	37	45	43	35	368 (0,61)
C04 Floor of mouth	125	116	148	153	150	162	199	184	179	201	1.617 (2,69)
C05 Palate	176	174	183	180	224	212	243	239	217	245	2.093 (3,48)
C06 Others unspecified parts of mouth	801	824	866	942	946	1.002	979	1.023	1.057	1.076	9.516 (15,83)
C07 Parotid gland	146	187	186	217	194	214	216	219	195	233	2.007 (3,34)
C08 Other major salivary glands	57	76	56	55	61	74	48	79	74	57	637 (1,06)
C09 Tonsil	140	152	133	137	118	143	145	153	136	138	1.395 (2,32)
C10 Oropharynx	1.135	1.187	1.264	1.376	1.369	1.383	1.465	1.549	1.627	1.635	13.990 (23,26)
C11 Nasopharynx	233	233	219	239	252	264	256	265	290	300	2.551 (4,24)
C12 Piriform sinus	59	67	53	67	57	66	53	59	79	72	632 (1,05)
C13 Hypopharynx	379	350	394	406	382	372	391	388	455	442	3.959 (6,58)
C14 Others unspecified location	803	807	835	861	960	864	945	917	1.018	1.076	9.086 (15,11)

There was growth trend of the mortality rate for the categories related to mouth C01 (Base of the tongue), C10 (Oropharynx) and for the sum of categories C00 to C14. The other remained stable for the period studied. [Table 3 and Figure 2].

Figure 2. Mortality rate series of oral and oropharyngeal cancers by major ICD-10 categories, Brazil, 2002 to 2011

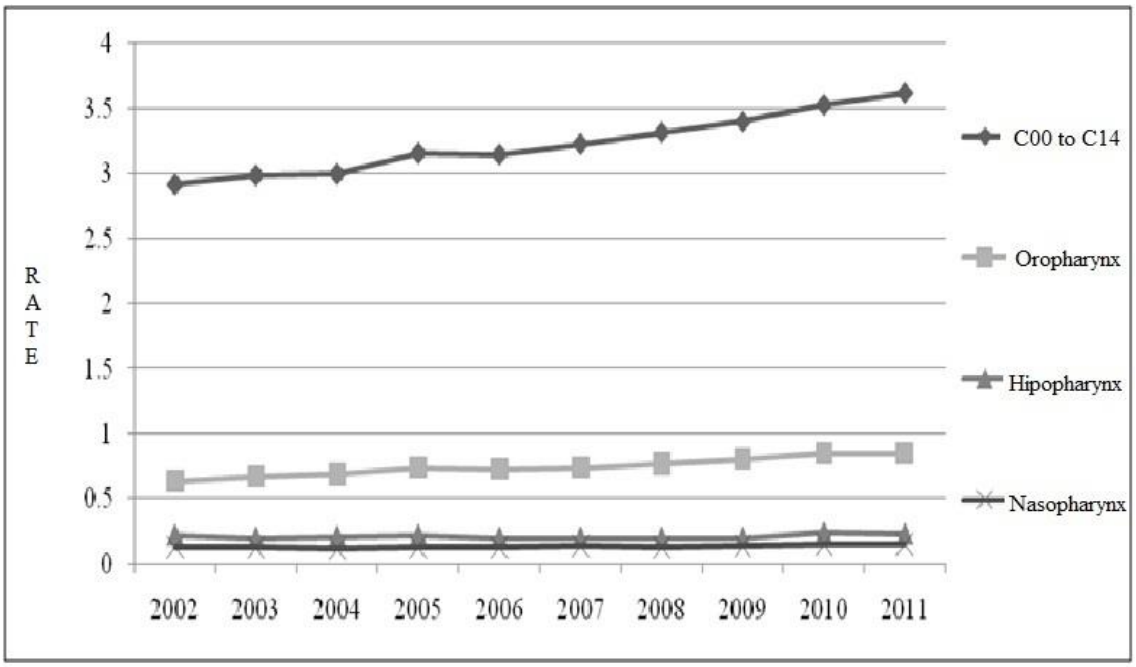


Table 3. Series of mortality rate from oral and oropharyngeal cancers, Brazil, 2002 to 2011[I].

Category ICD-10	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
C00 Lip	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03
C01 Base of tongue	0.16	0.17	0.17	0.18	0.15	0.18	0.20	0.22	0.21	0.23
C03 Gum	0.02	0.03	0.01	0.03	0.03	0.02	0.04	0.04	0.02	0.02
C04 Floor of mouth	0.07	0.06	0.08	0.08	0.08	0.08	0.10	0.09	0.09	0.10
C05 Palate	0.10	0.09	0.10	0.09	0.11	0.11	0.12	0.12	0.11	0.12
C10 Oropharinx	0.64	0.67	0.69	0.74	0.73	0.74	0.77	0.81	0.85	0.85
C11 Nasopharynx	0.13	0.13	0.12	0.13	0.13	0.14	0.13	0.14	0.15	0.15
C13 Hipophrynx	0.22	0.20	0.21	0.22	0.20	0.20	0.20	0.20	0.24	0.23
Total[II]	2.94	3.01	3.01	3.19	3.18	3.25	3.36	3.44	3.55	3.64

Supply: Mortality Information System (SIM)

(I) Rate per 100.000 inhabitants

(II) Cumulative rate for C00 to C14

DISCUSSION:

The results show a high number of oral cancer deaths for men and women with prevalence for the male gender. The lethality of this type of cancer may be associated with the late diagnosis of the injury at the beginning of the treatment [13,14].

According Cunha et al. [2009] the initial lesions are asymptomatic and individuals cope with the living with the tumor and only seek the health service when the injury bothers (self-perception) and, consequently, are at an advanced

stage to evolve to death [15]. The authors also claim that the oral cancer is undiagnosed (depending on the location of the lesion), made by visual inspection of the oral cavity by a health professional or by the individual and that the late diagnosis is related to no access to oral health service [15]. Study realized by Falcão et al. [2010] concluded that the dentists did not show knowledge necessary in relation to oral cancer and it is necessary to review the topic during professional training [16].

For Maciel et al. [2010] the early diagnosis of oral cancer can reduce the number of deaths, hospitalizations, treatment expenses and physical/psychological sequelae [17].

Lifestyle with greater intake of alcohol and tobacco use, exposure to sunlight (environmental conditions), low educational level (socio-economic conditions), certain labour activities and diet are singled out as key risk factors and risk factors associated with oral cancer [2,4-6,13,15]. However, the study found no association between cancer and smoking in young adults and suggests the need for prolonged exposure to risk factors and the multifactorial character of neoplasia type [14].

The discussion around the age prevalence in individuals aged points higher than 60 years[3,15]. It is can occur as a result of the slow progression of the disease and biological factor[15]. This fact does not rule out conducting studies on oral cancer mortality in children and adolescents[17].

The white skin color was prevalent in this study. This fact can occur as a function of exposure to ultraviolet rays and greater individual susceptibility. There was a predominance of brown color studies conducted in the Northeast region [18,19]. This divergence may have occurred due to the study design, predominance of Brown in the region studied population, environmental characteristics of the area or exposure to Ultraviolet (UV) rays without protection [19]. However, Cunha et al. (2009) found a balanced distribution between whites and non-whites in the Brazilian State of Paraíba [15].

Disregarding the of the non location origin of the injury, the category that showed the highest frequency of the oral cavity was the base of the tongue. Previous studies point tongue and palate [3,13].

As our study used data source the SIM and a high percentage of deaths occurs in hospital or residence. This fact can be an indicator of reliability of the information system with regard to the subregistro of this type of death [3]. Queiroz et al. [2003] stated the good quality of the data on mortality from oral cancer present in the SIM in the municipality of Rio de Janeiro [20]. However, previous studies claim that the use of secondary data could not control potential errors resulting from typing and registration, as well as possible despite the sub-entries mandatory filling of healthservices [21]. According to Campos et al. [2013] other factors that may affect the management of SIM, in small municipalities are: availability and high turnover of professional service, unofficial burials, the absence of medical professional to sign the

DD [22]. Study suggests the inclusion of information on exposure to risk factors such as smoking and alcohol consumption for improved data analysis and system [17].

It estimated that the non defined deaths must not exceed 10% of the total of deaths [22]. The high prevalence of deaths with the origin of injury not defined by SIM has been found in other studies [3,23]. This fact may indicate incomplete filling of the same is signed by a medical professional who is not assisted and there was even time for the additional exams [20]. In these cases the DD could be signed with the help of a dentist. Other features would make use of histopathological examination supplementary active search and investigation by the health surveillance service [20-22]. High prevalence of deaths not defined and with anatomical origin of non defined injury to oral and oropharyngeal cancer could disrupt the estimates of the mortality rate, incidence, trend and constitutes a limitation of SIM [23].

Borges et al. [2009] correlated socioeconomic indicators and the death rate for oral cancer [4]. Biazevic et al. [2006] showed the growth trend of mortality from oral and oropharyngeal cancer in São Paulo city between 1980 and 2002 [24]. Other studies have reported stability in the rate of oral cancer and increase the rate of oropharynx when the data are analyzed separately [8,23]. Maciel et al. [2012] identified difference in morbidity and mortality of the oral and oropharyngeal cancers among Brazilian capitals [25].

CONCLUSION:

The oral cancer deaths have high prevalence in Brazil and in the list of preventable deaths. Early diagnosis can be accomplished without great technical expertise/laboratory for health professionals and through self-examination. In Brazil, there was growth in the oral and oropharyngeal cancer mortality rates between 2002 and 2011. The Proportional Mortality Ratio (PMR) pointing to high health level for the country. The high number of deaths of non location origin of the injury hinders the understanding of the true mortality from oral and oropharyngeal cancers in Brazil. Despite the limitations the SIM is a source of reliable data to support studies on the mortality from oral and oropharyngeal cancer types.

Descriptive epidemiological studies help understanding the magnitude of mortality from oral cancer, assist the planning of actions oral health services that will reduce the burden of disease and provide subsidies for the development of future studies.

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