


## TIME FOR DIAGNOSIS AND TREATMENT OF ORAL CANCER IN BRAZIL: A NARRATIVE REVIEW

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**Sofia Bauer Rieger<sup>1</sup>, Luiz Evaristo Ricci Volpato<sup>2</sup> and Caren Bavaresco<sup>3</sup>**

### ABSTRACT

Oral cancer is the eighth most common type of cancer in Brazil and has a risk of death of 2.92 per 100,000 inhabitants. The mortality rate for oral cancers reaches 50% and many factors influence this trend, such as: the stage of the disease at the time of diagnosis and the time elapsed until the start of treatment. Many studies demonstrate delays in the diagnosis of oral cancer. The present study aims to verify the time taken by Brazilian patients to obtain the diagnosis and treatment of oral cancers. For this purpose, a retrospective survey of studies published in the last 25 years was carried out. Nine articles published between 2001 and 2021 were included. As a result, we identified that the average time it takes for the patient to seek a health professional from the moment the first symptoms are noticed was 166.5 days. After consulting a professional, it takes approximately 59.2 days to have the diagnosis confirmed and another 61.3 days to start treatment. Therefore, it takes around 287 days (9.6 months) for patients to notice the first symptoms and start treatment for oral cancer in Brazil. To reduce mortality related to oral cancer, agility, organization in the health care network and prevention actions are necessary, with increased access, early screening programs and health education.

**Keywords:** Diagnosis. Health services. Mouth Neoplasms.

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<sup>1</sup> MSc

University of Cuiabá. Cuiabá, Mato Grosso, Brazil

E-mail: [sofiarieger@gmail.com](mailto:sofiarieger@gmail.com)

ORCID: 0009-0001-6491-6881

<sup>2</sup> PhD

University of Cuiabá. Cuiabá, Mato Grosso, Brazil

Corresponding autor

E-mail: [odontologiavolpato@uol.com.br](mailto:odontologiavolpato@uol.com.br)

ORCID: 0000-0002-2969-1963

<sup>3</sup> PhD

Conceição Hospital Group. Porto Alegre, Rio Grande do Sul, Brazil

E-mail: [c\\_bavaresco@yahoo.com.br](mailto:c_bavaresco@yahoo.com.br)

ORCID: 0000-0002-0730-3632

## INTRODUCTION

The National Cancer Institute (BRAZIL, 2022) estimated the occurrence of 15,100 cases of oral cavity cancer in Brazil for each year of the three-year period from 2023 to 2025. This corresponds to an estimated risk of 10.30 new cases per 100,000 men and 3.83 per 100,000 women. Among Latin American countries, Brazil is the country with the highest mortality rate related to oral cancer, showing an increase since the 1980s and currently reaching 50% mortality (Boing, Peres & Antunes, 2006; Wünsch-Filho, 2002).

Important factors that influence the mortality trend are the time elapsed until diagnosis and the stage of the disease. Diagnosis at later stages implies a worse prognosis, the need for more radical and mutilating therapeutic approaches (Onizawa *et al.*, 2003), higher treatment costs, poorer quality of life and survival rates, and social rejection (Kowalski *et al.*, 1994; Bonfante *et al.*, 2014). Numerous studies suggest that up to 50% of patients present with advanced stage disease at the time of diagnosis. It is believed that the silent nature of the lesions and the delay in diagnosis are important factors for this high rate of advanced disease (Scott, Grunfeld & McGurk, 2005; Wildt, Bundgaard & Bentzen, 1995).

Although studies demonstrate delayed diagnosis of oral cancer (time elapsed between the perception of symptoms and the correct diagnosis and treatment), the factors involved have not yet been clearly demonstrated. This delay may be due to a lack of knowledge about oral cancer, both by patients and health professionals, and by barriers in health systems, leading to a lack of speed in diagnosis and initiation of treatment (Van Der Waal *et al.*, 2011; ).

In this context, the present study aims to conduct a narrative review to verify the time elapsed until diagnosis and initiation of treatment for oral cancer in Brazil.

## MATERIALS AND METHODS

This literature review performed a retrospective survey of scientific articles published from 2000 to 2025. The PUBMED, LILACS-BIREME and SCIELO databases were searched, in addition to the gray literature with a review of the reference lists of the included articles and academic productions identified by Google Scholar. The search strategy was oral neoplasm; oral cancer; diagnosis and health services. Studies that presented the time taken by the patient to diagnose and treat oral cancer in Brazil were included, regardless of the methodology used to collect this information and the language of publication. Studies published before the year 2000 were excluded.

The data were categorized in an Excel table with the following information: article title, year of publication and authorship; type of study; collection period; sample; location; patient gender; patient race; patient age; risk factors; cancer staging; time from the onset of symptoms perceived by the patient until seeking medical help (T1); time from the first consultation with a medical doctor until the definitive diagnosis of oral cancer (T2); time from the definitive diagnosis to the start of treatment (T3); total time spent by the patient from the perception of symptoms to the start of treatment (TT); other outcomes evaluated. A descriptive analysis of the variables of interest and descriptive calculations of averages were performed.

## RESULTS

Nine studies were included, identified through searches in databases and gray literature. The articles were published between 2001 and 2021. All were conducted in Brazil, two in the state of São Paulo (Campos, Chagas & Magna, 2007; Costa & Migliorati, 2001), two in Alagoas (Le Campion *et al.*, 2016; Santos *et al.*, 2012), two in Minas Gerais (Abdo *et al.*, 2007; Da Silva *et al.*, 2009), one in Rio de Janeiro (Da Conceição *et al.*, 2021), one in Rio Grande do Sul (Ludvig, 2021) and one in Espírito Santo (Gouvea *et al.*, 2010) (Table 1).

The average age of patients diagnosed with malignant lesions in the oral cavity was 60.9 years and a predominance of males was reported in all studies. Regarding the risk factors for the development of neoplasia, most patients had a history of alcohol consumption and smoking. The characteristics of the sample are shown in Table 2.

All studies that investigated the stage of oral cancer in the patients evaluated demonstrated the predominance of stages III and IV (Abdo *et al.*, 2007; Da Silva *et al.*, 2009; Gouvea *et al.*, 2010; Le Campion *et al.*, 2016; Santos *et al.*, 2012). The histopathological diagnosis of the lesions found in these patients was mainly squamous cell carcinoma (and its nomenclature variations: epidermoid carcinoma and squamous cell carcinoma) (Costa & Migliorati, 2001; Da Silva *et al.*, 2009; Gouvea *et al.*, 2010; Ludvig, 2021; Santos *et al.*, 2012). The lesions were found mainly on the tongue, floor of the mouth and alveolar ridges. The characteristics of the lesions are shown in Table 3.

The time spent by the patient diagnosed with oral cancer from the onset of symptoms to diagnosis and beginning of treatment is shown in Table 4 and was collected using different methodologies by the authors. Abdo and collaborators (2007) identified an

average time of 144.2 days for T1 and 73.1 days for T2+T3, totaling 217.3 days. Campos, Chagas & Magna (2007) recorded 75.1 days for T1 and 198.1 days for T2, with no data available for T3. Costa & Migliorati (2001) did not present values for T1 but reported an average time of 19.3 days for T2 and 65.7 days for T3. Da Conceição and collaborators (2021) also did not provide information on T1, presenting only the average time of 57.9 days for T2+T3. Da Silva and collaborators (2009) observed a range of 34 days for T1, 60 days for T2 and 45 days for T3, with a total time of 139 days. Gouvea and collaborators (2010) reported exclusively the time of T1, with an average of 261 days. Le Campion and collaborators (2016) described an average time of 197.8 days for T1, 20 days for T2 and 71.1 days for T3, totaling 288.9 days. Ludvig (2021) presented only the average time of 37.5 days for T2, with no data related to the other periods. Santos and collaborators (2021) reported a time of 287 days for T1, 20 days for T2 and 63.4 days for T3, with a total of 370.5 days.

The analysis of the averages reveals that the total average time (TT) covered by Brazilian patients, considering the studies that made this information available, was 287 days. Regarding the specific intervals, the average time for T1 (interval between the onset of symptoms and the first consultation) was 166.5 days. The average time for T2 (from the first consultation to diagnosis) was 59.2 days, while the average time for T3 (from diagnosis to the start of treatment) was 61.3 days.

**Table 1.** Articles included for review.

<b>First author (year)</b>	<b>Collection period</b>	<b>Place</b>
Abdo (2007)	01/1999 - 12/2001	Belo Horizonte / MG
Campos (2007)	02/2005 - 03/2006	Campinas e São Paulo / SP
Costa (2001)	11/1997 - 10/1998	São Paulo / SP
Da Conceição (2021)	01/2013 - 09/2015	Rio de Janeiro / RJ
Da Silva (2009)	01/2006 - 07/2007	Juiz de Fora / MG
Gouvea (2010)	Not informed	Vitória / ES
Le Campion (2016)	06/2005 - 06/2013	AL
Ludvig (2021)	2017- 2021	Porto Alegre / RS
Santos (2012)	08/2007 - 11/2008	Maceió / AL

**Table 2.** Characteristics of the samples.

First author (year)	Sample	Mean age	Predominant sex (%)	Identified risk factors
Abdo (2007)	≈ 170 *	58.4	Male (84.4)	-
Campos (2007)	64	56.2	Male (76.6)	-
Costa (2001)	15	66**	Male (60) **	67% smokers and 67% alcohol consumers **
Da Conceição (2021)	266	62.3	Male (64.7)	-
Da Silva (2009)	37	60	Male (86.5)	83,8% smokers and 94,6% alcohol consumers
Gouvea (2010)	46	57.7	Male (80.4)	54,3% smokers and alcohol consumers
Le Campion (2016)	121	64.3	Male (66.9)	91,7% smokers and 63,6% alcohol consumers
Ludvig (2021)	92	60	Male (70.7)	67,4% smokers and 54,2% alcohol consumers
Santos (2012)	50	63	Male (62)	90% smokers and 58% alcohol consumers

\* Heterogeneous sample in relation to the variables evaluated. \*\* Calculated from the data presented in the study.

**Table 3.** Characteristics of the lesions\*.

First author (year)	Staging	Anathomical site	Diagnosis
Abdo (2007)	78,8 % stages III or IV	Tongue (32.2%), mouth floor (23.3%) and retromolar region (15.0%)	-
Costa (2001)	-	Retromolar region (33.3%), tongue (26.7%), mouth floor (20%) **	Squamous cell carcinoma (66.7%) *
Da Silva (2009)	72,7% stage IV	Tongue (40.5%), mouth floor (21.6%), oropharynx (16.2%)	Squamous cell carcinoma (97.3%)
Gouvea (2010)	63% stages III or IV	-	Squamous cell carcinoma (97.8%)
Le Campion (2016)	40,5% stage III; 44,6% stage IV	Tongue (23.1%), mouth floor (18.2%), hard and soft palate (16.5%)	-
Ludvig (2021)	-	Tongue (30.4%), mouth floor (26.1%), palate (19.6%) alveolar ridge/gingiva (14.1%) lip (10.9%)	Squamous cell carcinoma (87%)
Santos (2012)	54% estage III or IV	Tongue (26%), combined sites (16%), retromolar region (8%) and mouth floor (8%)	Squamous cell carcinoma (92%)

\*Studies by Campos, Chagas & Magna (2007) and Da Conceição (2021) did not present information on characteristis of the lesions. \*\*Calculated from the data presented by the study.

**Table 4.** Mean time spent by the oral cancer patient from the perception of symptoms to the start of treatment.

First author (year)	T1 (days)	T2 (days)	T3 (days)	TT (days)
Abdo (2007)	144.2*	73.1 (T2 + T3)		217.3
Campos (2007)	75.1*	198.1	-	-
Costa (2001)	-	19.3	65.7	-
Da Conceição (2021)	-	57.9 (T2 + T3)		-

Da Silva (2009)	34*	60	45	139
Gouvea (2010)	261	-	-	-
Le Campion (2016)	197.8	20	71.1	288.9
Ludvig (2021)	-	37.5*	-	-
Santos (2012)	287	20	63.4	370.5
<b>Mean</b>	<b>166.5</b>	<b>59.2</b>	<b>61.3</b>	<b>287</b>

\*Calculated from the data presented by the study. T1: Mean time from the onset of symptoms perceived until seeking medical help; T2: Mean time from the first consultation with a medical doctor until the definitive diagnosis of oral cancer; T3: Mean time from the definitive diagnosis to the start of treatment; TT: Total time spent by the patient from the perception of symptoms to the start of treatment.

## DISCUSSION

Several studies investigated possible causal relationships for the delay observed in each stage of the therapeutic path of the diagnosis and treatment of oral cancer in Brazil. Campos, Chagas & Magna (2007) classifies T1 as “the patient’s time”, while Santos *et al.* (2013) emphasize that, based on the perception of the lesion, the responsibility for seeking care falls largely on the individual, thus attributing to the patient the main responsibility for the time elapsed in this initial phase. The data analyzed in this review indicate that the longest time interval throughout the patient’s trajectory is concentrated in T1. However, significant variability was observed between studies, with averages ranging from 34 to 287 days. It is worth noting that T1 is obtained from the patient’s report and, therefore, may be subject to memory bias, especially in elderly populations. Even so, it is essential to consider the information provided as valid, respecting its subjective nature. The slowness observed in this initial stage may be associated with the oligosymptomatic nature of oral neoplasms, the limited knowledge of the population about the disease, fear of diagnosis, as well as barriers to access to health services (Kowalski & Souza, 2001).

The higher incidence of oral cancer in men over 50 years of age was demonstrated by all included studies and agrees with other studies (Neville & Day, 2002; Scott, Grunfeld & McGurk, 2005; Wildt, Bundgaard & Bentzen, 1995; Fontes *et al.*, 2008; Castro *et al.*, 2016). Sex differences in illness and mortality are due to multiple factors, such as genetic or hormonal factors, biological factors and the presence of associated risk factors (Macintyre, Ford & Hunt, 1999; Verbrugge, 1989; Bird & Rieker, 1999; França *et al.*, 2012). Regarding exposure to risk factors, most of the studies reviewed also demonstrated that patients

diagnosed with oral cancer were mostly exposed to alcohol consumption and smoking, with the causal relationship between these elements already previously demonstrated (Dos Santos *et al.*, 2010; Scully, 2011).

The time intervals observed in this review are considerably longer than those reported in studies conducted in other countries. In the United States, the average time between the perception of an oral lesion and the search for professional care was 104.7 days (Peacock, Pogrel & Schmidt, 2008), lower than the time identified in the present survey. In England, Worrall & Corrigan (1995) found an average interval of only 6.4 days to obtain a histopathological diagnosis of oral cavity carcinomas, which represents a period almost ten times shorter than the one found in this review. Furthermore, the time between diagnosis and the start of treatment in that same English study was 25.8 days, also substantially lower than the mean time observed in the Brazilian studies analyzed. Considering the total time between the onset of symptoms and the start of definitive treatment, the North American data indicated an average of 205.9 days (Peacock, Pogrel & Schmidt, 2008), showing a delay of approximately three months in the Brazilian context.

The dentist is the professional most sought by the patient when an oral change is observed (Santos *et al.*, 2012) and is also the one who will initiate and conduct the diagnostic investigation of the lesion. Therefore, it is essential that oral health care is organized at all levels of health care. To ensure access to and quality of dental services within the Unified Health System (SUS), the National Oral Health Policy (PNSB) was created by the Ministry of Health in 2003 (BRASIL, 2004). Among the proposed actions is the prevention and control of oral cancer in Primary Care, with routine examinations, active search, campaigns, case monitoring and organization of the entire care network. An increase in screening for oral lesions and a decrease in the number of suspected and confirmed oral cancer lesions have already been demonstrated, possibly related to the reorganization of primary and secondary oral health care in the country induced by the PNSB (Pucca Jr, 2006). Considering the small number of studies included in this analysis, and the absence of more in-depth statistical evaluations, it cannot be inferred that the data presented here comprehensively represent the national reality. The provision of services by the health care network in Brazil is heterogeneous, evidencing structural flaws and significant disparities in the referral flows of patients with suspected oral cancer (Lombardo *et al.*, 2014). Furthermore, the country remains among the nations with the highest rates of social inequality in the world (Campello *et al.*, 2018), a reality that extends to the health

system, especially in terms of which refers to the disparities between the different geographic regions of Brazil. There is still a long way to go to consolidate a more equitable health system that is accessible to the entire population (Silva *et al.*, 2018).

Oral cancer is a disease that can be prevented easily, if emphasis is placed on health promotion, increased access to health services and early diagnosis (BRASIL, 2018). For Johnson and collaborators (2011), oral cancer is a disease of the poor and excluded and, to combat it, it is necessary to work on reducing social inequalities by creating and strengthening coordinated national public policies.

## CONCLUSION

Few and heterogeneous studies have been produced in Brazil regarding the periods for diagnosis and treatment of oral cavity cancer. The periods found demonstrate slowness and inequality in the Brazilian health system. To reduce mortality related to oral cancer, agility, organization in the health care network and prevention actions are necessary, with increased access, early screening programs and health education.

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