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Epidemiological landscape of tongue cancer in younger patients in a National Cancer Center in Brazil

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This study investigates the changing epidemiological profile of tongue squamous cell carcinoma (SCC) to young patients, highlighting its rising incidence among non-traditional risk groups. A retrospective descriptive study was conducted, covering data from medical records between 2000 and 2012. Patients were categorised into two age groups (≤ 40 years; 41–50 years). Sociodemographic and clinicopathological characteristics were evaluated. A total of 108 patients participated, mostly aged 41–50. Alcohol consumption (43.3%) surpassed smoking. Majority (56.7%) aged ≤ 40 never smoked. Lateral tongue border was most affected, with stages III and IV prevalent. Patients aged ≤ 40 were mostly eligible for surgery (44%). Survival tied to staging and surgery; age had no significant impact. Young squamous cell carcinoma patients often lacked traditional risk factors like smoking, underwent surgery, and typically had disease-free margins. The study underscores the importance of broad external policies for early diagnosis, beyond just traditional risk groups.

Keywords Oral cancer, Oral squamous cell carcinoma, Tongue cancer, Young patients, Survival

Around 90% of neoplasms located in the head and neck region are identified as squamous cell carcinoma (SCC), with the tongue being the most frequent primary tumour site and generally associated with an unfavourable prognosis[1–4]. Historically, SCC of the tongue mainly affects adult men and is strongly linked to tobacco and alcohol consumption. The combination of these two habits substantially increases the chances of developing SCC, compared to non-smokers or non-alcohol consumers[5]. Although anti-smoking and awareness campaigns have contributed to the reduction in cases of oral SCC, the incidence of tongue SCC is increasing in groups not traditionally associated with risk factors, such as female gender, and young people, with no apparent relationship with harmful habits[6–9]. Schantz and Yu (2002), in a comprehensive study covering the period from 1985 to 1997 and focussing on young North American patients, showed a significant increase in this neoplasm, with the tongue identified as the main site of incidence[10]. This finding is in line with other studies that indicate a notable increase in cases of SCC of the tongue among young individuals aged between 18 and 44, especially those who self-identify as white females. Notably, this trend is observed mainly among non-users of tobacco or alcohol, differing from the conventional risk factors associated with this neoplasm[11,12]. However, it remains unclear whether this pattern of increased incidence also applies to young, white men[13]. In this context, Human Papillomavirus (HPV), particularly type 16, is an important risk factor, predominantly affecting the oropharynx and altering the emerged epidemiological profile of this neoplasm, with a notable increase among populations not traditionally associated with SCC[14]. Simultaneously, other risk factors have emerged, such as opium use, viral infections (including Epstein-Barr and hepatitis C), immunodeficiency due to HIV or organ transplants, and genetic conditions like Fanconi's anemia[15]. The presence of these factors, combined with environmental exposures, poor nutrition, and chronic inflammation, significantly increases the likelihood of developing this disease.

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The complexity of this scenario reinforces the need for additional investigations to understand the causes underlying this change in the profile of head and neck cancer, especially in the context of demographic groups previously considered at low risk for this disease. Therefore, the present study aims to analyse the epidemiological profile of SCC of the oral tongue in young patients seen and treated at the Brazilian National Cancer Institute (INCA).

Materials and methods

Study design

A retrospective descriptive study comprising patients with SCC of the oral tongue diagnosed between 2000 and 2012 enrolled and treated at INCA, in Rio de Janeiro, Brazil was performed. In order to include young patients, this current study selected an age group up to 50 years old with SCC diagnosis according to the 3rd edition of the International Classification of Diseases for Oncology - ICD-O-3 - (C01, C02, C02.0, C02.1, C02.2, C02.3, C02.8, C02.9). Sociodemographic and clinicopathological data were obtained from medical records. It is important to note that there is no established standard for defining the age range for young and young adult populations concerning cancer, making such classifications subjective. Therefore, an age limit of up to 50 years was defined as a cutoff point for including younger patients in this study to investigate differences between this group and older adults. The following variables were collected: age, sex, race/ethnicity (according to the Brazilian Institute of Geography and Statistics - IBGE, classified in white, black, yellow, brown or indigenous) as well as alcohol and tobacco consumption. Tumour-related characteristics such as tumour topography, clinical staging (according to the *American Joint Committee on Cancer* - AJCC - TNM), morphology and histological differentiation (well; moderately or poorly - differentiated), treatment (surgery, neck dissection, margins, radiotherapy and/or chemotherapy) and survival outcomes were collected. To investigate the frequency of tongue cancer according to age, the patients were categorised into two age groups: ≤40 years or 41–50 years old.

Statistical analysis

All analyses were performed using IBM SPSS Statistics for Windows, version 24.0 (IBM Corp., Armonk, New York).

Descriptive analysis was performed using measures of central tendency and dispersion for continuous variables, and absolute and relative frequency for categorical variables.

The Pearson chi-square test was used to compare the distribution of categorical variables between two age groups: ≤40 *versus* 41–50 years old. The normality of the distribution of the age variable was assessed using the Kolmogorov-Smirnov test. Considering its non-parametric distribution, the variable was described using the median accompanied by interquartile values (interquartile range (IQR).

The exploratory assessment of survival was conducted at 5 and 10-year intervals following the commencement of treatment, employing the Kaplan-Meier methodology. The comparison between strata was performed using the log-rank test, assuming a statistical significance level of 5%. To identify independent variables associated with the risk of recurrence and death, the Cox regression model was used. The calculations for the statistical analyses were only carried out with valid data, and missing information was disregarded.

Ethical statements

The Ethics in Human Research Committee of the Brazilian National Cancer Institute approved this study in Rio de Janeiro, Brazil, under the registration number 0104.0.007.000–11 (CAAE). All methods were performed in accordance with the relevant guidelines and regulations. Due to the retrospective nature of the study, Ethics in Human Research Committee of the Brazilian National Cancer Institute waived the need of obtaining informed consent.

Results

Demographic features of patients

A total of 108 patients aged 22–50 years old with tongue SCC were eligible for the study. The average age was 45 years old (IQR 39–48), with 30 (27.8%) patients aged less than or equal to 40 years. Among all patients included, 60% were men and 63.3% identified as white. There was no statistically significant difference between the sexes of patients ≤ 40 and 41–50 years old.

Regarding habits, alcohol consumption was highly frequent, regardless of age (65.7%). It was not possible to obtain information about the amount of alcohol consumed. Data on smoking revealed that 67.6% of patients were current or former smokers, with 43.3% aged ≤ 40 years and 76.9% 41–50 years ($p = 0.001$). Furthermore, 56.7% of patients aged ≤ 40 years reported never having smoked, compared to 23.1% in the group of patients aged 41–50 years ($p = 0.001$) (Table 1).

Clinical profile

The most affected topography was the lateral border of the tongue (57.4%), in both age groups evaluated (≤ 40 years, 66.7%; 41–50 years, 53.8%, $p = 0.178$). In addition, 67.3% of patients were diagnosed in advanced staging (III or IV) having the highest predominance in 41–50 years old (73.1%) than ≤ 40 years old (51.7%) ($p = 0.036$). As for the degree of differentiation, 67.4% were moderately differentiated, with no significant difference between ages (Table 1).

With regard to the characteristics associated with the treatment, only 44.4% of the total cohort of patients underwent surgery either alone or in combination with other therapeutic modalities (≤ 40 years, 60%; 41–50 years, 38.5%). Within this subgroup of surgically treated patients, 37.0% underwent neck dissection and 44.4% had disease-free surgical margins. Although the differences were not statistically significant, there was a greater

Variables	Total *n**(%)	≤ 40 years *n**(%)	41–50 years *n**(%)	*p*-value
Sex				0.237
Male	74(68.5)	18(60.0)	56(71.8)	
Female	34(31.5)	12(40.0)	22(28.2)	
Race/ethnicity				0.085
White	62(57.4)	19(63.3)	43(55.1)	
Black	10(9.3)	5(16.7)	5(6.4)	
Brown	36(33.3)	6(20.0)	30(38.5)	
Alcohol consumption				0.092
Never	37(34.3)	14(46.7)	23(29.5)	
Current and former	71(65.7)	16(53.3)	55(70.5)	
Smoking status				**0.001**
Never	35(32.4)	17(56.7)	18(23.1)	
Current and former	73(67.6)	13(43.3)	60(76.9)	
Topography				0.178
Base of the tongue	16(14.8)	3(10.0)	13(16.7)	
Lateral border of the tongue	62(57.4)	20(66.7)	42(53.8)	
Not specified	18(16.7)	2(6.7)	16(20.5)	
Overlapping	12(11.1)	5(16.7)	7(9.0)	
Clinical staging**				**0.036**
III-IV	72(67.3)	15(51.7)	57(73.1)	
I-II	35(32.7)	14(48.3)	21(26.9)	
Neck dissection				0.199
No/NA	68(63.0)	16(53.3)	52(66.7)	
Yes	40(37.0)	14(46.7)	26(33.3)	
Free margin				**0.044**
No/NA	60(55.6)	12(40.0)	48(61.5)	
Yes	48(44.4)	18(60.0)	30(38.5)	
Differentiation				0.109
Well differentiated	14(13.0)	6(20.0)	8(10.3)	
Moderately differentiated	86(79.6)	20(66.7)	66(84.6)	
Poorly differentiated	8(7.4)	4(13.3)	4(5.1)	
Treatment				0.056
RXT	12(11.1)	0(0.0)	12(15.4)	
SUR	15(13.9)	5(16.7)	10(12.8)	
SUR + RXT	23(21.3)	7(23.3)	16(20.5)	
SUR + RXT + CT	10(9.3)	6(20.0)	4(5.1)	
CT + RXT	41(38.0)	11(36.7)	30(38.5)	
No treatment	7(6.5)	1(3.3)	6(7.7)	
Surgery				**0.044**
Yes	48(44.4)	18(60.0)	30(38.5)	
No	60(55.6)	12(40.0)	48(61.5)	
Radiotherapy				0.143
Yes	76(70.4)	18(60.0)	58(74.4)	
No	32(29.6)	12(40.0)	20(25.6)	
Final status				0.186
Alive	33(30.6)	12(40.0)	21(26.9)	
Death	75(69.4)	18(60.0)	57(73.1)	

Table 1. Characteristics of tongue cancer patients ($N = 108$). NA = Not applicable; RXT = radiotherapy; SUR = surgery; CT = chemotherapy. * Valid data only. ** Missing: 2 cases. Statistically significant results are in bold.

number of patients under the age of 40 who were eligible for neck dissection, reaching a rate of 46.7%, compared to the group of patients over 40 years of age (33.3%). Interestingly, patients ≤ 40 years old had a 60% higher prevalence of disease-free surgical margins compared to patients over 40 years of age (Table 1).

Survival analysis

When looking at the determinants of overall survival across the entire sample (Table 2), the factors that had a significant impact on survival were advanced clinical staging ($p < 0.001$), no neck dissection ($p < 0.001$), no free margin of disease ($p < 0.001$) and no surgery in the therapeutic proposal ($p < 0.001$).

Variables	Death *n**	%	5 year. OS % (SD)	10 year. OS % (SD)	Median yr. (95%CI)	*p*-value (log rank)
Age						0.204
≤ 40 years	18	60.0	32.1(9.2)	32.1(9.2)	1.4(1.2–1.6)	
> 40 years	57	73.1	28.0(5.3)	17.1(6.4)	1.1(0.9–1.3)	
Sex						0.528
Male	55	74.3	27.0(5.3)	16.2(6.2)	1.2(1.0-1.4)	
Female	20	58.8	34.4(8.7)	34.4(8.7)	1.2(0.9–1.5)	
Race/ethnicity						0.139
White	39	62.9	31.9(6.2)	31.9(6.2)	1.2(0.9-1.5)	
Black	6	60.0	57.1(16.4)	0(0)	6.9(0-17.9)	
Brown	30	83.3	17.2(6.5)	0(0)	1.0(0.7–1.3)	
Alcohol consumption						0.196
Never	22	59.5	40.7(8.4)	32.6(9.9)	1.3(0.9–1.7)	
Current and former	53	74.6	23.4(5.3)	13.6(6.6)	1.2(0.9–1.5)	
Smoking status						0.327
Never	20	57.1	36.9(8.8)	36.9(8.8)	1.2(1.0-1.4)	
Current and former	55	75.3	26.2(5.3)	13.6(6.6)	1.2(0.9–1.5)	
Topography						0.082
Base of the tongue	15	93.8	18.8(9.8)	6.3(6.1)	1.0(0.8–1.2)	
Lateral border of the tongue	40	64.5	31.4(6.2)	27.9(6.5)	1.3(1.1–1.5)	
Not specified	14	77.8	20.0(9.9)	20.0(9.9)	0.6(0.4–0.8)	
overlapping	6	50.0	46.3(15.0)	46.3(15.0)	1.6(**)	
Clinical staging						**< 0.001**
III-IV	60	84.5	15.6(4.5)	0 (0)	1.0(0.9–1.1)	
I-II	13	37.1	59.1(8.8)	59.1(8.8)	NR	
Surgery						**< 0.001**
No	57	95.0	5.1(2.9)	2.6(2.3)	0.9(0.7–1.1)	
Yes	18	37.5	62.1(7.5)	43.0(13.9)	9.0(5.0–13.0)	
Neck dissection						**< 0.001**
No/NA	58	85.3	12.6(4.2)	8.4(4.4)	0.9(0.7–1.1)	
Yes	17	42.5	58.3(8.3)	35.3(15.6)	9.0(3.5–14.5)	
Free margin						**< 0.001**
No/NA	57	95.0	5.1(2.9)	2.6(2.3)	0.9(0.7–1.1)	
Yes	18	37.5	62.1(7.5)	43.0(13.9)	9.0(5.0–13.0)	
Differentiation						0.392
Well differentiated	12	85.7	8.6(8.1)	8.6(8.1)	1.0(0.5–1.6)	
Moderately differentiated	58	67.4	33.4(5.3)	21.2(7.4)	1.2(0.9–1.5)	
Poorly differentiated	5	62.5	16.7(15.2)	16.7(15.2)	1.3(0-2.9)	
Treatment						**< 0.001**
RXT	12	100.0	0(0)	0(0)	0.5(0.05-1.0)	
SUR	2	13.3	82.1(11.7)	82.1(11.7)	NR	
SUR + RXT	11	47.8	56.5(10.3)	48.4(11.6)	6.9 (**)	
SUR + RXT + CT	5	50.0	51.9(17.6)	0(0)	9.0 (**)	
CT + RXT	38	92.7	7.5(4.2)	3.8(3.4)	1.0(0.9-1.1)	
No treatment	7	100.0	0(0)	0(0)	0.4(0.3–0.5)	

Table 2. Assessment of overall survival for tongue cancer patients ($N = 108$). OS = Overall survival; SD = Standard deviation; CI = Confidence interval; NA = Not applicable; NR = Median not reached. * Valid data only ** Incalculable Statistically significant results are in bold.

Patients under 40 years old had an overall survival of 32.1% in five and ten years while patients 41–50 years had lower rates (28.0% and 17.1% respectively) ($p=0.204$) (Table 2). In relation to topography, patients with cancer of the lateral border of the tongue had worse overall survival, both at 5 and 10 years. It is interesting to note that among the group of patients with the base of the tongue affected, 93.8% died, compared to 64.5% of the patients with an affected lateral border of the tongue (Table 2).

Survival curves revealed that patients with tongue SCC had a poor 10-year overall survival rate (Fig. 1A). Patients who were diagnosed at an advanced stage with consequent ineligibility for surgery, neck dissection, without disease-free margins and who underwent radiotherapy had a worse 10-year survival rate when compared to patients diagnosed early and who underwent these procedures (Fig. 1B-F).

Univariate analysis revealed that advanced clinical stage (HR = 4.3; 95%CI 2.3–7.8), not undergoing surgery (HR = 6.1; 95%CI 3.5–10.6), and lacking neck dissection (HR = 4.1; 95%CI 2.3–7.1) were significantly associated

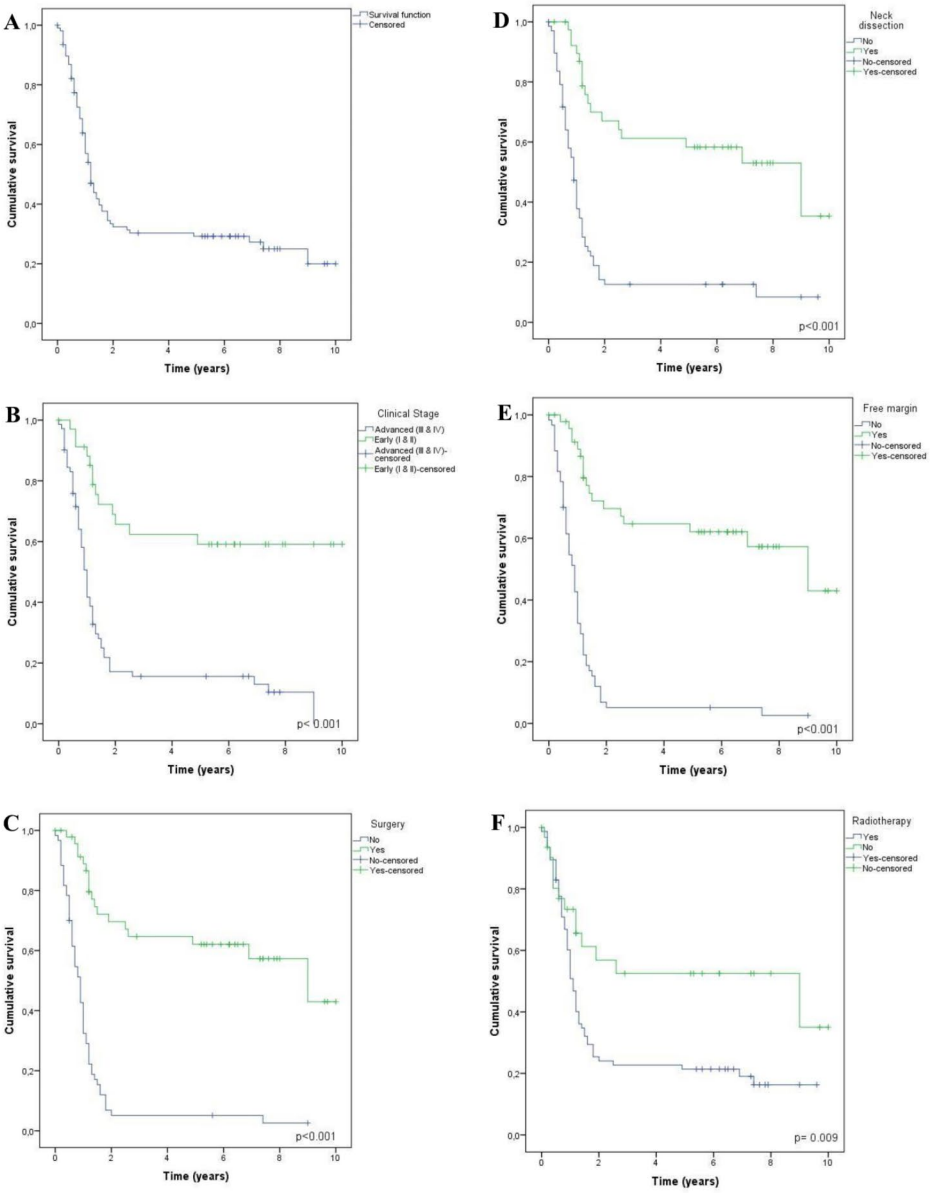

Fig. 1. Overall survival for tongue cancer patients.

with increased risk of death associated with tongue cancer. Conversely, achieving disease-free margins was a protective factor, associated with a lower risk of death (HR = 0.2; 95%CI 0.09–0.3). However, upon analysing adjusted hazard ratios (HRs), only advanced clinical staging with HR = 2.6; 95%CI 1.4-5.0 ($p = 0.004$) and patients not undergoing surgery with HR = 4.6; 95% CI = 2.5–8.2 ($p < 0.001$) emerged as significant risk factors. Alcohol and tobacco consumption, cancer topography, age and gender, among others, were not indicated as risk factors for death in this study (Table 3).

Discussion

Historically, SCC of the tongue has been more prevalent in male patients, middle-aged, smokers and alcohol drinkers[16,17]. However, scientific literature shows an increase in the number of SCC cases among specific groups, including young people aged between 18 and 44 years old, females, and among patients who do not use tobacco or alcohol[11,12]. Park et al. (2010) observed that, in a group of 85 patients diagnosed with SCC of the tongue, 27.1% were under 40 years of age[18], while Liao et al. reported that, among 296, patients with SCC of the tongue, 76 (25.8%) were ≤ 40 years-old[19] corroborating the present study, where it was found that 27.7% of patients were younger than 40 years old. Although there is no agreement between tongue SCC studies regarding the definition of the age range for classifying young individuals, some studies establish young patients as up to 40 years of age[20,21]. In view of this, we used this age cut-off point as the basis for our analyses.

Studies that have highlighted this increasing frequency of young patients affected by SCC of the tongue have also demonstrated that they are not associated with traditional risk factors[22–25]. Santos-Silva et al., observed that 48.6% of patients in the younger subgroup declared themselves as non-smokers, compared to 10.7% in the subgroup of older patients who did not smoke[26]. These results corroborate the findings of our study, in which it was found that 56.7% of patients aged ≤ 40 years reported never having smoked, in contrast to the group of patients aged > 40 years, in which this percentage was 23.1%. Similarly to what was observed by Santos-Silva and co-workers, the present study did not demonstrate significant differences in alcohol consumption between ages, with both groups showing high percentages of consumption. It should be noted that within the timeframe of this study (2000–2012), electronic cigarettes and their derivatives[27] were not popularly consumed in Brazil[28,29], suggesting that these were not risk factors related to the cases observed. Although retrospective analyses have not identified other potential risk factors related to SCC of the tongue in the young population, some investigations suggest the involvement of Human Papillomavirus (HPV)[30–32], mainly in cases where the base of the tongue is the affected subsite, which may be correlated with HPV-related oropharyngeal carcinoma[33]. Additionally, Heller et al., 2023, in a systematic review and meta-analysis on patients with oral cancer and non-smokers suggested the association of these patients with other factors such as alcohol consumption, diet, oral health and medical comorbidities[34]. In a molecular context, a few studies have investigated the cellular and genetic aspects that may be associated with the development of cancer in young patients. Valero et al. (2022), in a study of 2073 patients diagnosed with oral SCC, found that young (age < 40), non-smoking patients were more likely to die of cancer than young smokers. The authors related these results to the poorer prognosis of these patients and pointed out that young, non-smoking patients also had an impaired immune system, with a higher neutrophil/lymphocyte ratio[35]. In addition, a study by Santos et al. (2011) showed that young patients with oral SCC have greater genomic instability when compared to older patients, indicating that genetic alterations may be an important strategy for assessing these patients[26,36,37]. Bahethi et al. (2020), in a systematic review of case reports and case series, brought together 13 studies, 12 of them on squamous cell carcinoma of the tongue in young patients without exposure to traditional risk factors such as tobacco and alcohol. The authors demonstrated a series of genetic alterations in these patients, with the majority of the studies involving *TP53* mutations[38]. These studies reinforce the need for further investigation into the factors associated with young patients with oral cancer.

Although the most frequently affected primary site was the lateral border of the tongue, in agreement with what was observed by da Silva Souto et al., 2021, the data revealed that among the patients who presented SCC at the base of the tongue, 93.8% died, being also one of the sites with the lowest survival rate, with 6.1% overall survival rate in 10 years[39]. It is worth emphasising that we cannot exclude the possibility that sites classified as base of the tongue are also related to malignant neoplasms of the oropharynx, along with unspecified sites.

A study by Cohen Goldemberg and co-workers (2018) showed that the majority of patients affected by tongue cancer are diagnosed late in Brazil (65.4%)[40] consistent with the findings of this study, which revealed a percentage of 67.3%, with a high percentage in both age groups, as well as a worse survival rate, 0% in 10 years. In addition, the analyses in this study show that patients diagnosed with advanced staging have a higher risk of death. These data reflect the need to reinforce public health policies on the importance of early diagnosis of oral cavity cancer, in addition to greater attention to the potentially malignant disorders of the oral cavity[41]. As well as having a direct impact on prognosis, late diagnosis can contribute to the lack of specification of the primary subsite at the time of diagnosis, as observed in some of the cases analysed in this study, and consequently classified as unspecified or overlapping.

Although both age groups were diagnosed at an advanced stage, these data suggest that age was an important factor in the choice of treatment. Young adult patients were mostly eligible for a more invasive treatment, such as surgery (60%) in contrast to 38,5% of adult patients over the age of 40. In addition, our analyses showed that patients who did not undergo surgery had a higher risk of death, regardless of age.

It is interesting to note that the majority of young patients had disease-free margins (60%) and although the data was not significant, 46.7% of younger patients underwent neck dissection, suggesting a better prognosis. Lee et al., in a meta-analysis involving 23,382 patients with oral SCC, showed that although younger patients were eligible for more invasive treatments, there was no significant difference in survival when compared to older adult patients[42]. The same was found in the present study when comparing overall survival in both groups with 32.1% at five years for patients ≤ 40 years and 28.0% for patients > 40 years. However, this slight difference

Variables	Crude HR (95% CI)	*p* value	Adjusted HR (95% CI)	*p* value
Age				
> 40 years	Ref.			
≤ 40 years	0.7(0.4–1.2)	0.218		
Sex				
Male	Ref.			
Female	0.9(0.5–1.4)	0.538		
Race/ethnicity				
White	Ref.			
Black	0.8(0.3–1.9)	0.626		
Brown	1.5(0.9–2.4)	0.091		
Alcohol consumption				
Never	Ref.			
Current and former	1.4(0.8–2.3)	0.209		
Smoking status				
Never	Ref.			
Current and former	1.3(0.8–2.1)	0.340		
Topography				
Base of the tongue	Ref.			
Lateral border of the tongue	0.6(0.3–1.1)	0.096		
Not specified	1.1(0.5–2.2)	0.837		
Overlapping	0.5(0.2–1.2)	0.115		
Clinical staging				
I-II	Ref.			
III-IV	4.3(2.3–7.8)	< **0.001**	2.6(1.4-5.0)	**0.004**
Neck dissection				
Yes	Ref.			
No/NA	4.1(2.3–7.1)	< **0.001**		
Free margin				
No/NA	Ref.			
Yes	0.2(0.09–0.3)	< **0.001**		
Differentiation				
Well differentiated	Ref.			
Moderately differentiated	0.7(0.4–1.2)	0.186		
Poorly differentiated	0.7(0.3-2.0)	0.533		
Treatment				
No treatment	Ref.			
RXT	0.6(0.3–1.7)	0.359		
SUR	0.02(0.004-0.1)	< **0.001**		
SUR + RXT	0.07(0.02–0.2)	< **0.001**		
SUR + RXT + CT	0.08(0.02–0.3)	< **0.001**		
CT + RXT	0.3(0.1–0.6)	**0.002**		
Surgery				
Yes	Ref.		Ref.	
No	6.1(3.5–10.6)	< **0.001**	4.6(2.5–8.2)	< **0.001**
Radiotherapy				
No	Ref.		Ref.	
Yes	2.1(1.2–3.8)	**0.013**		

Table 3. Factors associated to risk of death in tongue cancer patients ($N = 108$). HR = Hazard ratio; CI = Confidence interval; NA = Not applicable; RXT = radiotherapy; SUR = surgery; CT = chemotherapy. Statistically significant results are in bold.

suggests that younger patients may have a better survival rate than adult patients over 40, but more research is needed to clarify this relationship.

This study has some limitations that are worth highlighting. The total sample size was 108 patients aged between 22 and 50 diagnosed with tongue cancer. It is important to note that no cases of diagnosis of this

neoplasm in patients under the age of 22 were identified. Furthermore, when investigating tongue SCC in patients under the age of 40, it was noted that most of the time they are not associated with traditional risk factors such as smoking and alcohol consumption. However, it is crucial to note that this study did not address other potential risk factors that may be related to the development of this neoplasm. Another relevant limitation is related to late diagnosis, which contributed to the lack of specification of the primary subsite at the time of detection, as observed in some of the cases analyzed in this study. This lack of specificity can result in classifications such as "non-specific" or "overlapping", hindering a more detailed and specific analysis of the patterns of occurrence and risk factors associated with specific areas of the tongue.

Conclusion

Most young patients with squamous cell carcinoma were not exposed to traditional risk factors such as smoking. Furthermore, these patients frequently have undergone surgery and, for the most part, had disease-free margins. However, the five- and ten-year survival rates did not show significant differences in relation to the age group. The most affected topography was the lateral border of the tongue, and the predominance of diagnoses in the advanced stage highlights the complexity of this neoplasm regardless of age. Thus, these results highlight the importance of developing public policies aimed at early diagnosis, not only for groups known to be at risk for tongue SCC. Regardless of whether the patient is young or not, alterations with the potential for malignant transformation should always be monitored. This practice will contribute to the early diagnosis of oral cancer. Furthermore, it would be extremely important for future studies to investigate other potential risk factors related to this neoplasm.

Data availability

Data is available upon request. Please contact the corresponding author by e-mail to obtain the data used in the study.

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Competing interests

The authors declare no competing interests.

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