Original Article

Prevalence of Tongue Carcinoma in Young Population: A Retrospective Institutional Study

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ABSTRACT

Background: Oral cancer is the most common cancer in India, and tongue is one of the most frequently affected sites in young people with rising prevalence in all. In many countries, the prevalence of intraoral cancer appears to be increasing, particularly in younger people. Although the quantitative relationship is equalizing, malignant neoplastic disease affects males several times more often than females, and in recent times, raised cases are being identified jointly as young females in older women. However, the prevalence of oral squamous cell carcinoma (SCC) is growing in individuals below the age of 40 years. **Aims and Objectives:** The aim of the study was to find out the prevalence, histopathology grading, and tumor, nodes, and metastases (TNM) stage of the SCC involving tongue among the young patient's with the objective being to find out the prevalence of tongue SCC at the particular anatomic sites, age group, gender, and associated habits, at tertiary academic medical center in Bareilly population over the period of 5 years. **Materials and Methods:** The current retrospective research was conducted by analyzing the medical history of pathologically confirmed oral tongue SCC cases diagnosed at a tertiary academic medical center in the area of Bareilly from January 2014 to December 2019. The patients were divided into two age categories: Older (over 40 years of age) and younger (ages 40 and below). Data were contrasted between the two groups associated with tongue carcinoma prevalence, associated habits, tumor and histopathological features, and node and metastases grading. **Results:** The findings showed that, out of 137 (27.9%) cases of tongue SCC cases, 78 (56.9 %) (58 males and 20 females) SCCs of tongue cases were found in young patients and 59 (43.1%) (41 males and 18 females) SCCs of tongue cases were determined in older patients with male predominance in both age groups. The majority of cases in young age group showed significant mixed habits, moderately differentiated grade and 47 cases were presented at advanced clinical stage of TNM (III and IV), while only 31 cases were presented at early stage (I and II). **Conclusion:** SCC of the tongue could also be related to a variable clinical course in younger patients. While the disease-specific outcome is typically analogous to that of older patients, there is an unusually aggressive disease in some patients. In addition to providing instructions on the treatment regimen to be followed in each case of oral SCC, tumor, node, and metastasis grade of malignant tumor (TNM grade) has been used for several years to predict the prognosis and survival of carcinoma patients, such that early diagnosis and prevalence of carcinoma helps to increase the quality and quantity of lifespan of the patients.

Key words: Metastases grades, nodes, squamous cell carcinoma, tongue carcinoma, tumor, young patients

INTRODUCTION

Oral cancer is the sixth most common cancer in the world. It is a major oncological problem in the regions of the world where tobacco habits in the form of chewing and/or smoking with or without alcohol intake are common. It typically occurs in elderly men during the fifth to eighth decade of life and is rarely seen in young people. India alone accounts for ¼ (77,000 cases) of total variety of carcinoma cases across the world.[1] Tongue cancer is one of the foremost common cancers of the mouth in India, having an occurrence rate of 9.4/100,000/year.[2] The median age at the identification of the tongue's cancer is 61 years. Only around 2% of patients are diagnosed before the age of 35 and another 7% before the age of 45, this despite the particular fact that there's associate increasing trend among the prevalence of tongue squamous cell carcinoma (SCC).[3] The comparatively high occurrence of carcinoma in India is especially because of very standard use of the smokeless tobacco product referred to as gutkha and betel quid chewing (with or while not tobacco) that renders its

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population and notably its youth to a greater risk of developing oral submucous fibrosis, a premalignant disease leading to enhanced occurrence of carcinoma in younger patients.[4] Of those, oral tongue SCC is one in all the foremost common malignancies among the males.[1] Tongue SCC usually affects men from the sixth through the eighth decades of life, sometimes once a few years of alcohol or tobacco abuse.[5] SCCs of tongue in young adults are traditionally thought of as notably aggressive clinical entities, with a high risk of locoregional relapse, survival rates inferior to those of the overall head-and-neck cancer group, and need for an additional aggressive therapy.[6] The survival rates for patients of carcinoma reaches only up to 30% in developing countries as compared to 54% in developed countries.[2] The poor survival in developing countries might even be attributed to the presentation of patients in advanced stages, delayed identification, and treatment with poor compliance.[7] Therefore, this study was conducted to supply a holistic picture of tongue cancer among the young Indian population.

MATERIALS AND METHODS

The present study retrospectively reviewed 137 patients who were diagnosed for SCC of the tongue, between January 2014 and December 2019, at the tertiary academic medical center in Bareilly region, included surrounding area of Bareilly zone (Uttar Pradesh), India. The aim of the study was to determine the prevalence, histopathology grading, and tumor, nodes, and metastases (TNM) stage of SCC involving tongue among young patients with the prevalence of tongue SCC at the specific anatomic sites, age group, gender, and associated habits. Subjects lacking of demographic records such as age, gender, habits, histopathology record, and TNM stage were excluded from the study. The cases of total tongue SCC patients were classified into two age groups, aged over 40 years and below 40 years. The final research sample consisted of 59 patients over 40 years of age (the older group) and 78 young patients below 40 years of age (younger group) [Table 1].

The following data were taken from the files of the patient report: Age, gender, associated habits, characteristics of the histopathological tumor, and TNM stage. The habits classified into chewing, smoking, alcohol, and mixed type [Table 2]. By cell differentiation, the tumors were histopathologically classified into well-differentiated, moderately differentiated, and poorly differentiated grades inadequately reliable to the standards of the World Health Organization. All tumors were staged according to the American Joint Committee on Cancer system.[8]

Statistical analysis

Statically analysis was done using SPSS version 22.0, Windows (Redmond, WA). Chi-square test was used to analyze the differences between the variables according to age group.

RESULTS

A total of 137 (27.9%) cases of tongue carcinoma diagnosed at the Tertiary Academic Medical Centre in the Bareilly area were retrospectively examined from January 2014 to December 2019. The demographic characteristics of the patients are summarized in Table 1. As shown, out of 137 cases of SCC of tongue, 78 patients aged 40 years or younger (58 males and 20 females) and 59 patients aged over 40 years (41 males and 18 females) with a substantially higher male preponderance were recorded in the SCC of tongue patients in both age groups. Cases of tongue SCC presented in the advanced stage in both age groups (young and older age group), Stage III (47[26 and 21]) and Stage IV (38[22 and 16]), whereas cases of tongue SCC presented in the early stage (young and older age group), Stage I (31[20 and 11]) and Stage II (21[13 and 8]). Based on cell differentiation by histopathology, cases of tongue SCC patients were classified as moderately differentiated 37 (47.4%) in younger patients and 29 (49.1%) in older patients, well differentiated 22 (28.2%) in younger patients and 18 (30.5%) in older patients, and poorly differentiated 19 (24.3%) in younger

Table 1: Demographic detail and characteristic between young patients (≤40 years) and older patients (>40 years) diagnosed with tongue carcinoma

Total number of tongue carcinoma cases (5 years duration)	137 (27.9%) cases of tongue carcinoma in all population	
Age	<40 years (young patients' cases)	More than 40 years (older patients' cases)
Tongue carcinoma cases	78 (56.9%)	59 (43.1%)
Gender	Male – 58 (74.4%)	Male – 41 (69.5%)
	Female – 20 (25.6%)	Female – 18 (30.5%)
TNM staging (grading)		
Stage I	20 (25.6%)	13 (22.0%)
Stage II	11 (14.1%)	8 (13.6%)
Stage III	26 (33.3%)	22 (37.3%)
Stage IV	21 (26.9%)	16 (27.1%)
Histopathologic grade of cell differentiated		
Well differentiated	22 (28.2%)	18 (30.5%)
Moderate differentiated	37 (47.4%)	29 (49.1%)
Poorly differentiated	19 (24.3%)	12 (20.6%)

TNM: Tumor, nodes, and metastases

Table 2: Risk factors (associated habit or not associated habit) in young patients of tongue SCC cases

Habit nature of tongue SCC cases	Young patients' cases (<40 years)	Older patients' cases (>40 years)
Total number of tongue squamous cell carcinoma cases 137	78	59
Type of habits		
Chewing	14 (17.95%)	20 (33.89%)
Smoking	21 (26.92%)	13 (22.03%)
Alcohol	18 (23.07%)	11 (18.6%)
Mixed	25 (32.05%)	15 (25.4%)

SCC: Squamous cell carcinoma

patients and 12 (28.2%) in younger patients and 18 (30.5%) in older patients [Table 1].

In older patients of tongue SCC cases, 20 (33.89%) cases had a history of chewing habits, 15 (25.4%) cases had a history of mixed habits, while 13 (22.03%) cases had a history of smoking habits, 11 (18.6%) cases had a history of alcohol habits, and in younger patients of tongue SCC cases, 14 (17.95%) cases had a history of chewing habits, 25 (32.5%) cases had a history of mixed habits, while 21 (26.92%) cases had a history of smoking habits, 18 (23.07%) cases had a history of alcohol habits [Table 2].

DISCUSSION

Head-and-neck cancers in India present a severe health concern.[9] Oral tongue carcinoma, with a strong correlation with alcohol and tobacco use, is traditionally associated with middle-aged men. Oral carcinoma risk increases with the level, frequency, and duration of tobacco and alcohol use.[10] There are several carcinogens in smokeless tobacco and tobacco smoke, and increased exposure increases the danger of oral and potentially malignant disorders.[11] Some recent articles have reported an increased rate of SCC of the tongue in young patients. In Shantz *et al.*'s review of the SEER database, tongue cancer in patients <40 years old increased 62% from 1973–1984 to 1985–1997 and accounted for 35% of OSCC.[12] Retrospective research conducted by Son and Kapp, indicated that the disease follows a more aggressive path in young patients.[13]

The latest research has shown the occurrence of tongue SCC in the younger and older age groups. Some studies have shown that in young patients, the occurrence of tongue SCC is increasing. However in patients younger than 40 years, a modest rise in the occurrence of OSCC has been observed. According to Müller *et al.*,[14] Komolmalai *et al.*,[15] Bodner *et al.*,[16] and Fan *et al.*,[17] the most common site in the younger age group is the tongue. The study conducted by the Muller S *et al.*,[14] that revealed marginally higher number of mobile tongue cases were found. This finding indicated the changing OSCC pattern in recent years. Changes in etiological factors for smoking and lifestyle changes are also associated with carcinoma initiation in adolescents.

Kapila *et al.*[18] research also showed the highest frequency of tongue followed buccal mucosa in both age groups. According by Abdulla R *et al.*,[19] and Sherin N *et al.*,[20] and Siriwardena BS *et al.*,[21] the buccal mucosa was most common site in older patients cases and tongue was most common site in younger patients cases of OSCC, the reason behind it may be, due to the associated oral bad habits. In the older patient cases, the buccal mucosa and buccal sulcus are more commonly affected site due to placement of tobacco quid's within the mouth whereas Tongue and floor of the mouth carcinoma are more common in younger patients' cases due to consumption of smoking and alcohol.

This study diagnosed male predominant SCC of the tongue, 74.4% in the young age group and 69.5% in the older age group. Oliver *et al.*[22] and Srivastava *et al.*[23] showed that the occurrence of OSCC in young people was higher in males, which also showed that the occurrence of tongue SCC was higher in males. This result is consistent with the previous studies. This gender discrepancy seems to reflect the real fact that the prevalence of betel quid chewing, which is considered to have a cause-effect relationship with mouth cancer, is far higher among men in India than among women. In our sample, only 38 were women out of 137 patients. This is also almost the same as the 25–30% previously reported from India, but 4–7% reported from Taiwan.[24]

The present study showed that the prevalence of tongue cancer is low in older age group patients as compared to young age group. The area may also be because the buccal mucosa, gingiva, and buccal sulcus are more frequently affected in older OSCC patient cases due to the placement of tobacco (different forms) in the mouth and tongue, and floor of the mouth carcinoma is more common in Western countries due to alcohol intake and smoking. In our study, the majority of patients used smoking habits, followed by mixed and alcohol habits in the young age group and chewing habits, followed by mixed habits in the older age group. In recent years, a growing number of young patients have been diagnosed with oral SCC who announce that they have never smoked or drank alcohol excessively. In the older population, tobacco smoke and alcohol misuse are considered well-established risk factors for oral SCC. This might point to the actual fact that tobacco habits are a significant determinant of buccal mucosa cancer compared to tongue cancer. Smoking habits and alcohol consumption are not common among females in Sri Lanka, although the habit of betel chewing among females appears to be as prevalent as that of males.[21] This may be one of the reasons why oral SCC is more prevalent in males than in females.

Furthermore, the duration of exposure to these risk factors must be long enough to have a harmful effect. In patients 45 and younger, Llewellyn *et al.*[25] analyzed risk factors for oral cancer and showed substantially elevated odds ratios for oral cancer in patients who smoked for 21 years and longer. The overexpression of p53 in < 40 years of tongue SCC patients mostly not associated any identified risk factors. This points to the possible effect of additional etiological factors that could be at work, such as genetic susceptibility, immunodeficiency, or viral infection. The overexpression of p53 in individuals <40 years of age with tongue cancer and no identified risk factors was studied by Lingen *et al.*[26] Müller *et al.*[14] noted that 81% of these patients overexpressed p53 protein but did not display mutations in p53 gene exons 5–9, which are reported to occur in elderly patients in at least 50% of OSCC. Thus in young patients, the molecular mechanisms of OSCC production may differ compared to older patients. Llewellyn *et al.*[25] found that long-term consumption of a fresh fruit and vegetable diet decreased the risk of OSCC in patients aged 45 years or older.

The majority of cases of tongue SCC in the young age group in our sample belonged to the advanced stage (Stages III and IV) and the older age group belonged to the early stage (Stages I and II) of the TNM grade, so the findings are consistent with Jeon *et al.*[27] study of the advanced stage of the disease (Stage III/IV) group of young patients, while older patients presented with advanced stage disease (Stage III/IV).

Most of the SCC of tongue cases showed early Stages I–II (72.4 %) in cases above and below 40 years in a study

by Oliver *et al.*[22] The high percentage (60–80%) of the advanced diagnostic stage in India has been recorded by studies and has been largely attributed to India's lack of screening and early detection programs. The most serious stage is TNM-Stage IV. The earlier the process of diagnosis, the survival rate improved.

Based on histopathologic characteristics, there were more moderately differentiated cases of tongue SCC in the younger and older age groups. According to Manuel S *et al.*[14] Sasaki T *et al.*[28] well differentiated tumours was commonest in younger patients cases, But they found moderately differentiated tumours was commonest in older patients cases. However, they found moderately differentiated tumors in <40-year-old age group, according to Udeabor *et al.*[29] Kapila *et al.*[18] showed a higher trend in younger individuals for poorly differentiated tumors. OSCCs grading and metastatic status at the time of diagnosis is important because it determines the therapy plan and the prognosis along these lines.

Counting on the stage and site of OC, various therapies such as radiotherapy, chemotherapy, surgery, and brachytherapy are available. If carcinoma is diagnosed during the first phase of development, better treatment outcomes are shown. One of the most important causes in India is the late diagnosis of carcinoma, which makes the prognosis of the disease worse.

There has been some debate in the literature on whether young patients with oral tongue SCC require more intensive care than older patients. Several authors have stated that young patients with SCC of the tongue show slow improvement with lower survival rates than older patients and thus need more intensive therapy than older patients.

A 1994 research by Sarkaria and Harari indicated that the outcomes (53% cause-specific survival) in young tongue cancer patients were worse than the outcomes in older tongue cancer patients.[27] However, several authors have stated that in terms of outcomes, young patients display no differences from older TSCC patients. No significant differences in survival rates between the two age groups were identified in a study by Friedlander *et al.*[30]

CONCLUSION

In the present study, 137 (27.9%) cases of SCC of tongue were found, 56.9% of cases was diagnosed in young age group and 43.1% was diagnosed in older age group with a substantially higher male preponderance which were recorded in the SCC of tongue patients in both age groups. The present research suggests a stronger early-stage prognosis of carcinoma tongue and warrants greater understanding and health education within health facilities and as a population with sufficient staging for early detection of the disease and subsequently multimodal care to improve survival rates. In most Asian countries, especially in India, the burden of carcinoma has increased; hence, increasing national-level public awareness programs across the country may require time for prevention, early detection, and diagnosis, and to promote a tobacco-free climate. If the steps taken by the government so far have not been able to discourage people from using tobacco products, it must be a matter of debate and discussion and of utmost importance to rethink whether a full ban on their production and sale should not be feasible.

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