

Early Detection Of Oral Cancer In Young Population While Assessing Oral Health Among Indian Population: An Original Research

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ABSTRACT

Aim

The purpose of the present research was to retrospectively evaluate characteristics for early detection of oral cancer amongst young Indian population.

Methodology

A retrospective analysis of the patients under the age of 35 years with oral cancer presented at our institution between 2010-2021, was carried out. The anatomical sites reviewed in this study included lip, buccal mucosa, upper and lower alveolus, hard palate, anterior 2/3 of tongue and floor of mouth. Variables analysed for each patient included age, sex, history of tobacco and alcohol abuse, history of any cancer in the first-degree family members etc. Statistical analysis was carried out with the data received.

Results

A total of 264 patients under the age of 35 years with oral cancer in the 11-year period from 2010-2021 were retrospectively analysed. Tongue was the commonest site identified in 136 (52%) patients followed by buccal mucosa in 69 (26%), alveolus in 26 (10%), palate in 12 (4.5%), lip in 6 (2.3%), floor of mouth in 5 (1.9%) and other intraoral non-specified sites in 10 (3.8%).

Conclusion

Sensitivity of various early detection methods was highest in case of toluidine dye -lugol's iodine combination followed by VelScope and visual inspection. Prevention, early diagnosis, and timely treatment are critical aspects to tackle oral cancer-related burden in India.

Keywords Adult, Carcinoma, Retrospective Studies, Risk Factors.

INTRODUCTION

Oral cancer is a global health problem with increasing incidence and mortality rates; more than 500 000 patients are estimated to have oral cancer worldwide.¹ Oral cavity squamous cell carcinoma (SCC) accounts for 90 – 94% of oral cancers, but various malignancies, such as salivary gland malignancies, soft and hard

tissue sarcomas and metastatic cancers, also occur.^{2,3} Survival rates for oral cancer are very poor, at approximately 50% overall, and have not improved markedly in the last few decades despite advances in therapeutic interventions.^{4,5} It is now well established that early diagnosis of oral malignancies is an effective way of improving the clinical outcome for patients.⁵

Detecting oral cancer at an early stage, when lesions are small or localized, is believed to be the most effective means to reduce death, morbidity and disfigurement from this disease.⁶ As compared to the west, the concern of oral cancer is significantly higher in India as about 70% of the cases are reported in the advanced stages (American Joint Committee on Cancer, Stage III-IV). Because of detection in the late phase, the chances of cure are very low, almost negative; leaving five-year survival rates around 20% only.⁷ Potentially malignant disorders (PMDs) such as inflammatory oral submucosa, fibrosis, erythroplakia, leukoplakia, candidal leukoplakia, dyskeratosis congenital, and lichen planus are indicators of the preclinical phase of oral cancer.⁸ Tobacco consumption including smokeless tobacco (SLT), betel-quid chewing, excessive alcohol consumption, poor oral hygiene, nutrient-deficient diet, and sustained viral infections, i.e. human papillomavirus (HPV) are some of the risks associated with the occurrence of oral cancer. Lack of knowledge, exposure to extreme environmental conditions, and behavioral risk factors are indicators of a wide variation in the global incidence. Periodontal illnesses are also a high-risk consideration for oral malignancy, and it has a higher incidence among the Indian population, where oral cancer occurrence is mainly due to the habit of chewing paan.⁹ More than 90% of types of oral cancers originate in the squamous cells that line the inside of the mouth. When the growth of these cells gets out of control, it causes a cancer called squamous cell carcinoma or squamous cell carcinoma. Other types of oral cancers, such as partial malignancies of the salivary glands, sarcomas, odontogenic malignancies, melanoma, and lymphoma, make up less than 10% of oral cancers¹⁰ and approximately 1% of metastatic cancers are lung, breast, prostate and kidney.¹¹ Squamous cell carcinoma can have various levels of differentiation and often give rise to node metastases. Lymphatic spreading into the neck is directly related to the T stage as well as the depth of invasion and tumor thickness.¹² Routine biopsy in people with clinically characteristic precancerous lesions may lead to early detection of the underlying cause of oral cancer. In addition to history, physical examination, and biopsy, simultaneous evaluation of the upper aerodigestive tract is essential because patients with oral cancer are at risk for cancer of other

parts of the head, neck, and lungs.¹³ Oral health status and family history should also be evaluated for any syndromes that may increase the risk of oral cancer. In addition to the history, a complete examination of the head and neck is performed to carefully examine the location and spread of the primary tumor and identify metastases. It is noteworthy that early-stage cancerous lesions may be red or white plaques and non-ulcerative. More advanced cancers are ulcerative, aggressive, fungal, and prominent, or both. Literature suggests that oral cancers in young patients show a general trend of aggressive course and poor prognosis.¹⁴ We carried out this study to define the clinical characteristics and most importantly early detection amongst young patients with oral cancer.

AIM OF THE PRESENT STUDY

The purpose of the present research was to retrospectively evaluate characteristics for early detection of oral cancer amongst young Indian population.

METHODOLOGY

A retrospective analysis of the patients under the age of 35 years with oral cancer presented at our institution between 2010-2021, was carried out. Data extraction was carried from electronic database by the ICD - codes for site and age < 35 years. The anatomical sites reviewed in this study included lip, buccal mucosa, upper and lower alveolus, hard palate, anterior 2/3 of tongue and floor of mouth. Variables analysed for each patient included age, sex, history of tobacco and alcohol abuse, history of any cancer in the first-degree family members, presence of premalignant lesions, histology, clinical extent and lymph node involvement at the time of presentation. The patients were staged according to the American Joint Committee on Cancer (AJCC) staging system.¹⁵ All patients were evaluated for the treatment employed. All variables were entered in a database for analysis. Descriptive statistical measures like mean and standard deviation was done.

RESULTS

A total of 264 patients under the age of 35 years with oral cancer in the 11-year period from 2010-2021 were retrospectively analysed. Tongue was the commonest site identified in 136 (52%) patients followed by buccal mucosa

in 69 (26%), alveolus in 26 (10%), palate in 12 (4.5%), lip in 6 (2.3%), floor of mouth in 5 (1.9%) and other intraoral non-specified sites in 10 (3.8%). (Table 1) There were 184 (70%) males and 80 (30%) females, with a male to female ratio of 2.3:1. The significantly highest male preponderance was noted in patients with cancer of buccal mucosa (4.3:1). The mean age at presentation was 30.7 years (SD+5). The

presentation of tongue cancer was slightly earlier compared to buccal mucosa cancer. Forty-four % of cases of carcinoma-tongue presented below 30 years compared to 27.5% of carcinoma of buccal mucosa. Family history of cancer was present in 23 (9%) patients while family history of oral cancer was present in 9 (3%) patients.

Table 1- Habit pattern of patients analysed

Habits	Lip	Tongue	Alveolus	Floor of mouth	Buccal mucosa	Palate	Others	Total
No	3	41 (30%)	2	2	9 (13%)	7	7	71 (26%)
Yes	3	67 (49%)	7	2	55 (79.7%)	4	11	149 (56%)
Don't know	0	25	4	1	8	1	5	44

Table 2- Efficacy of early detection methods

Methods	Tongue (mean± SD)	Buccal mucosa (mean± SD)	Others (mean± SD)	Overall sensitivity
Visual inspection	1.9 ±1.03	2.56 ±2.01	3.01 ± 2.44	61.3 %
Toluidine blue-lugol's iodine	1.01 ± 0.43	1.59± 1.22	2.77± 2.01	85.3%
VelScope	1.3 ± 0.85	1.91± 1.29	2.86± 2.34	75.1%

Precancerous lesions in the form of leukoplakia, sub mucous fibrosis, lichen planus and erythroplakia were present in 35 (11%) patients. More than half of the patients 149 (56.4%) were habituated to either tobacco chewing, smoking or alcohol. About 67 (49%) of tongue cancer patients and 55 (79.7%) patients with buccal mucosa cancer were habitués. Various methodologies such as visual examination, VelScope-aided investigation, and toluidine dye with Lugol's iodine application was also performed for early detection of any oral malignancies, where the sensitivity was highest in case of toluidine dye-lugol's iodine combination (85.3%) followed by VelScope (75.1%) and visual inspection (61.3 %). (Table 2)

DISCUSSION

Oral tongue was the most common site in the present series constituting 52% of all cases followed by buccal mucosa, which formed 26%. This is in contrast to the earlier report on all oral cancer cases from our centre, where buccal mucosa cancers outnumbered the tongue cancer (49.9% and 23.9% respectively).¹⁶ Only

about half of the cases in this series were addicted to tobacco and alcohol compared to 99% of habitués in the older population in the earlier series.¹⁷ The number of habitués was higher in buccal mucosa cancer (79.7%) compared to tongue cancer (49%). This may point to the fact that tobacco habits are a major determinant of buccal mucosa cancer compared to tongue cancer; the latter seemed to have a different aetiology at younger age. Some authors have suggested that cancer in young adults tends to be more frequently anaplastic resulting in a more aggressive behaviour and poor prognosis.¹⁸ Despite the ready accessibility of the oral cavity to direct examination, these malignancies are often still not detected until a late stage and, as a result, the survival rate for oral cancer has remained essentially unchanged over the past three decades.¹⁹ The 5-year survival rate for small tumours approaches 80% but falls to 30% for stage 4 disease.²⁰ Late diagnosis results in more expensive, aggressive and disfiguring treatments, lower survival rates, lower function and lower quality of life among survivors. Oral SCC is painless and asymptomatic in the early

stages and prompts the patient's self-referral only when symptoms develop. Public awareness of oral cancer seems alarmingly low, as demonstrated by Horowitz et al., who found that fewer than 25% of subjects could name alcohol or tobacco as risk factors.²¹ Use of a cancer information leaflet had a significant effect in raising the long-term level of knowledge of oral cancer in the general public and also had a secondary effect on disease awareness in the locale.²² Comprehending the importance, numerous research groups across the globe are working on techniques that could aid in early diagnosis of oral cancer. Apart from physical examination, the other techniques recommended are, 1) X-Rays, 2) CT, 3) PET, 4) MRI, and 5) Endoscopy. Moreover, histopathological examination, vital staining techniques, biopsies such as brush biopsy, biomarker detection with biosensors or immunohistochemistry, radiology, and optical imaging systems are the most commonly used methods for diagnosis of oral cancer in India. Since the prognostic results are always better in early stages of the disease, the need for early detection and clinical down staging should be stressed. More in-depth studies are needed to investigate the aetiology of intraoral cancer in younger patients. Any ulcer or lesion at a younger age should not be dismissed easily, even if it is not habit related. High index of clinical suspicion in high incidence areas should lead to further investigation in order to identify the disease in early stage, which is perhaps the only way to ensure good prognosis.

CONCLUSION

India is considered as the world capital for oral cancer cases as it shares one-third of the global burden. About 60–80% of the patients in India suffering from oral cancer are detected in the advanced stages in comparison to 40% in developed countries, which contributes to an increased mortality rate. Prevention, early diagnosis, and timely treatment are critical aspects to tackle oral cancer-related burden in India.

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