

Clinical and histopathological profile of oral cancer: a quadrennial analysis of Regional Cancer Centre of Odisha, India

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Abstract. – OBJECTIVE: To contribute toward the identification of population-based clinical and histopathological profile of oral squamous cell carcinoma (OSCC), this study was undertaken at the Regional Cancer Centre of Odisha (AHRCC), India.

PATIENTS AND METHODS: This retrospective study included all patients diagnosed with OSCC registered at AHRCC, Odisha from 1st January 2015 to 31st December 2018. Demographic, clinical, and pathological data of each patient were retrieved from patient records. Patients with incomplete records were excluded. No postoperative treatment details were collected.

RESULTS: The study included 851 cases of OSCC with the mean age of the population found to be 53.8±14.2 years. Male to female ratio was found to be 2.18:1. Gingivobuccal complex was the most common site of OSCC. While 679 patients were reported to undergo incision biopsy only 172 patients underwent excision biopsy in four years. Well differentiation (n=782) is the most common histological grading. The median clinical size of the tumour was 4 cm. Upon analyzing histological parameters in excision specimens lymphovascular and perineural invasion were seen in 38 and 26 cases, respectively. Cervical lymph node metastasis was seen in 42 cases out of 172 excision specimens (24%). 63.23% of cases presented with a depth of invasion between 5 to 10 mm.

CONCLUSIONS: This is the largest comprehensive data from the regional cancer center of Odisha population which highlights the demographic, clinical, and histopathological data reported to date.

Key Words:

Epidemiology, Oral cancer, Oral squamous cell carcinoma, Retrospective study.

Introduction

Oral cancer is the eighth most common cancer worldwide and ranks among top three cancers in India¹. Consumption of tobacco in several forms is the main reason of high prevalence of oral cancer in India and other Southeast Asian countries. Despite the advanced corrective measures in diagnosis and treatment, the mortality rate due to oral cancer is increasing. Few reasons may be late diagnosis, delay in treatment after diagnosis and failure to evaluate prognostic determinants. Incidence and prevalence of oral cancer in India vary widely across several states. While most states of India have reported the clinicopathologic profile of Oral cancer^{2,3}, Odisha is lagging behind having

no existing data on epidemiological and clinicopathological profile of oral cancer in Odisha. Being one of the highest consumers of tobacco, the epidemiological and clinicopathological data on oral cancer in Odisha population is much desired information. In addition to that it has been noticed that the conventional clinical and histopathological features of oral cancer differ from the recent ones. To mention few of them, “age^{4,5”}; “gender^{6”} and “incidence among non-habitues^{7,8”} are among those features.

The objective of the study was to report the demographic and clinicopathological profiles of oral squamous cell carcinoma (OSCC) in the regional cancer center of Odisha. To observe the recent trend of OSCC and the association of clinical and histopathological factors of OSCC with nodal metastasis are the secondary objectives.

Patients and Methods

Ethics committee approval was obtained from the Ethics Committee of the Acharya Harihara Regional Cancer Centre (AHRCC) (069-IEC-AHRCC dtd 3.7.2018). The biopsy registers of AHRCC, Odisha was archived from December 2018 to January 2015. All parameters extracted from these patient records were entered into the predesigned excel sheet. The study included cases of oral squamous cell carcinoma and excluded other benign and malignant epithelial and connective tissue neoplasms like salivary gland tumours, metastatic tumours and tumours of nasopharynx and hypopharynx. Demographic data such as age and gender, clinical data such as site of lesion, type of biopsy for all patients were recorded. Further the data of cases that have undergone neck dissections were selected and parameters like surgery procedures, histopathological grading, depth of invasion (DOI), nodal status, perineural invasion (PNI) and lymphovascular invasion (LVI) were collected. Broder’s system of histopathological grading was followed.

Statistical Analysis

Descriptive statistics were carried out by using SPSS software version 21.0 (IBM Corp., Armonk, NY, USA). Association between DOI, PNI and LVI with lymph node metastasis in excision biopsy specimens were evaluated by Chi-square analysis. $p < 0.05$ was considered as statistically significant.

Results

In a four-year time, span starting from 2015 to 2018, there were in total 1045 patients identified from the patient records of Head and Neck Onco-pathology, AHRCC, Odisha. Upon excluding the benign and malignant tumours of oral cavity other than oral squamous cell carcinoma a total of 851 were included in the study. Of the 851 cases 127, 475 and 249 patients were less than forty years, between 40 and 60 years and more than 60 years, respectively. Predominant age group presented to the cancer centre was found to be 40-60 years with mean age of the population was 53.8 ± 14.2 years. Overall male to female ratio was found to be 2.18:1 (584/267). The data extracted revealed pathologically confirmed cases of oral squamous cell carcinoma (OSCC) of all subsites of head and neck cancer. Gingivobuccal complex (n=571) was the most affected site followed by tongue (n=185). Upon analyzing histological factors majority of cases were presented with well differentiation (n=782). Further details Clinical and histopathological details of the study cohort can be found on Table I.

While 679 patients were reported to undergo incision biopsy only 172 patients (%) underwent excision biopsy in four years. Most common surgical modality followed was supraomohyoid neck dissection (47.4%). Only in 37 cases tumour size in the excision biopsy specimen was mentioned out of which the median size is 4 cm. Upon analyzing histological parameters in excision specimens (n=172) lymphovascular and perineural invasion were seen in 38 (28.4%) and 26 (20%) cases respectively. Cervical lymph node metastasis was seen in 42 cases out of 172 excision specimens (24.4%). Out of 42 cases with positive lymph node status LVI and PNI were seen in 16 cases each. 63.3% cases presented with depth of invasion between 5 to 10 mm. presence of residual tumour in microscopic findings were reported only in 33 cases out of 172 excision biopsy specimens. Out of 159 cases only 5.7% of cases were classified as R1 while rest as R0. Chi square analysis showed a significant association of depth of invasion with LVI ($p=0.03$) and cervical lymph node metastasis ($p=0.001$).

Discussion

The population of Odisha, an eastern state of India in 2020 is 4.71 Crore⁹. Acharya Harihara

Table I. Clinical and histopathological details of the study cohort.

Clinical characteristics	Number of cases (%)
Age (in years) (n = 851)	
< 40	127 (14.9)
40-60	475 (55.8)
> 60	249 (29.3)
Gender (n = 851)	
Male	584 (68.6)
Female	267 (31.4)
Site (n = 851)	
Gingivobuccal complex	571 (67)
Tongue	185 (21.7)
Palate	48 (5.6)
Lip	41 (4.8)
Floor of mouth	06 (0.7)
Tumor size (n = 37)	
Median	4 cm
Range	2-13 cm
Surgery (n = 137)	
SOND	65 (47.4)
MRND	52 (38)
RND	11 (8.02)
Others	9 (6.6)
Pathologic characteristics	
Grading (n = 851)	
Well differentiation	782 (91.9)
Moderate differentiation	63 (7.4)
Poor differentiation	06 (0.7)
Depth of invasion (n = 136)	
< 5 mm	22 (16.2)
5-10 mm	86 (63.23)
> 10 mm	28 (20.6)
Vascular invasion (n = 134)	
Yes	38 (28.4)
No	96 (71.6)
Perineural invasion (n = 130)	
Yes	26 (20)
No	104 (80)
Cervical lymph node metastasis (n = 172)	
Yes	42 (24.4)
No	130 (75.6)
Residual tumor (n = 159)	
R1	09 (5.7)
R0	150 (94.3)

Regional Cancer Centre (AHRCC) is a tertiary cancer care center located in district Cuttack of Odisha. It is established in 1983 to cater tertiary care to cancer patients not only from thirty districts of Odisha but also from neighbor states. Therefore, the sample in our study may not truly represent the Odisha population and prevalence of oral cancer in Odisha population may not be clearly interpreted from the existing data. The data collected retrospectively for four years from

December 2018 to January 2015 may thus establish the epidemiological and clinicopathological profile of patients reporting to AHRCC, Odisha which may foster further research efforts leading to amended cancer control in the state. These findings may also strengthen the record keeping system of such cancer centers.

Oral cancer in this study cohort is most common among males with a male to female ratio of 2.18:1. This is in accordance with global literature¹⁰⁻¹² as well as most Indian states' data^{2,3,13-16} although a female predilection has been observed in south India¹⁷. Mean age as found in this study was 53.8±14.2 years. This is supporting Tandon's² findings were contradicting the trend in many Indian states^{3,14,15} where they have reported an younger age group. This could be due to the fact that majority of oral cancer in Odisha may be tobacco induced rather than other causes which predispose oral cancer in young individuals. However, percentage of young patients (14.9%) in this study was reasonably high which is indicating a recent alarming rise in incidence among young individuals. Buccal mucosa along with lower alveolar ridge and retromolar trigone are called as gingivobuccal complex and aptly known as "Indian Oral cancer" because that constitute more than 60% of all oral cancer cases in India^{17,18}. Buccal mucosa was shown to be the most frequently involved site followed by tongue which is well supported in many populations^{2,14} except in western Uttar Pradesh and Andhra Pradesh population where tongue is the most frequently affected site^{19,20}. Occurrence of palate and lip in this study may be a cause for more common chewing tobacco than smoking tobacco as cancer of lip and palate are noticed more in those who smoke.

Most of the cases report to the hospital at an advanced stage. This may be due to multiple reasons. First, AHRCC is a tertiary care center. So, it takes time for a patient to travel from primary to tertiary care centre. Second, inaccessibility of oral cancer patients to early diagnostic or screening aids. Third, there may be ignorance and lack of awareness among Odisha population who seek the medical examination only when the lesion becomes symptomatic and attains a reasonably large size. When dental surgeon is the first to diagnose oral cancer the ratio of dentist to population is 0.8 to 1 lakh in Odisha²¹. This may be the fourth cause of presentation at advanced stage. WHO recommends a 1:7500 ratio of dentist to population²². Because majority of dentists

cluster in urban regions of Odisha, rural areas are incapacitated in committing early diagnosis of oral cancer.

There were 172 patients having details of excision out of 851 cases. The most frequent treatment modality for OSCC is surgery followed by and/or chemotherapy and radiotherapy²³⁻²⁵. Palliative radiotherapy has lately become a treatment modality in non-operable cases. The treatment strategy depends upon characteristics of the primary tumour like site, clinical staging, histopathology and nodal status²⁶. Other than tumour characteristics patient characteristics like age, response to treatment, consent, socioeconomic status are other parameters to influence treatment protocol²⁶. Many of these factors may have adversely influenced the low proportions of patients undergoing surgery. Supraomohyoid neck dissection was found to be the most common surgical treatment in this study cohort. Lymphatic drainage of head and neck mucosa does not occur in erratic manner but rather in a constant relatable and predictable route^{27,28}. In accordance with this, supraomohyoid neck dissection is the most commonly used surgery in OSCC.

Combining the histological findings of both incisional and excisional biopsy it has been observed that the frequency of well differentiated tumours is far more than moderate and poorly differentiated tumours. This finding is well supported by almost all studies conducted in other parts of India^{15,29,30}. However, there is very few studies reporting histopathological profile of OSCC. Histopathological grading of OSCC usually follows Broder's grading system. Because of the smaller size of biopsy specimen having greater heterogeneity and subjective differences, histopathological grading may have a weak impact on prognosis of OSCC.

Histopathological prognosticators in excision specimens are depth of invasion, lymphovascular invasion and perineural invasion which are reported to have predictive potential for lymph node metastasis. Out of 172 specimens of excision biopsy only 42 cases (24.4%) were positive for one or more nodal metastasis. Incidence of cervical lymph node metastasis in Indian population was reported as less than 50%³¹. Therefore, Sahoo et al³² has also reported a frequency of 39.3% of nodal metastasis among patients of another tertiary care centre of Odisha. Specific finding on frequency of nodal metastasis to different levels would have provided further information which

was not possible in our study because of lack of descriptive excision biopsy reports. In fact, a complete data on TNM staging would have also established a correlation between clinical (cN) and histological (pN) nodal status. There are only 16 cases with data on TNM staging. Both LVI and PNI were found to be positive in 66.7% of cases with positive nodal status. Frequency of PNI and LVM were reported as 37.37% and 45.8% respectively in cases with positive nodal status in another tertiary care hospital of Odisha³². A higher frequency of LVI and PNI in this study may be attributed to a larger sample size in this study. Presentation of oral cancer patients to AHRCC at an advanced stage may be another reason for higher frequency of LVI and PNI in this study. Depth of invasion has been recently included in AJCC cancer staging manual (8th edition)³³. Depth of invasion, in patients among AHRCC was found to be in the range of 5 mm to 10 mm. Because of correlation of site specificity of depth of invasion to regional nodal metastasis further identification of site-specific depth of invasion is required.

Conclusions

Variations in culture, geographic factors, ethnicity, habits, socioeconomic status, and lifestyle factors are attributed to variations in demographic and clinicopathologic profile of oral cancer in different parts of India. Therefore, such state wise data on oral cancer are necessary to understand risk factors and progression of oral cancer in different regions. However, for a comprehensive analysis, there is a great space of improvement in hospital record keeping process.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Ethics Approval

Ethics Committee approval was obtained from the Ethics Committee of the Acharya Harihara Regional Cancer Centre (AHRCC) (069-IEC-AHRCC dtd 3.7.2018).

Informed Consent

Not applicable.

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Authors' Contributions

Sw.P., Sas.P., N.M., M.G., L.C., C.C., A.G.L., F.G., C.M., M.D.F., and Sau.P. conceived and designed the analysis. All the authors contributed on analysis and interpretation of data for the work. All authors revised the work critically for intellectual content. Integrity of the work was appropriately investigated and resolved by all authors. All authors contributed and approved equally to the final version of the manuscript.

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