

Demographic and Clinicopathological Associated Risk Factors in Oral Cancer in Rajasthan: A Retrospective Study

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ABSTRACT

Objective: To ascertain the correlation between sociodemographic and clinic-pathological risk variables and oral cancer.

Materials and methods: At Mahatma Gandhi Medical College & Hospital (MGMCH) in Jaipur, Rajasthan, India, a two-year cross-sectional survey was conducted. The Medical Records office provided medical records for 300 patients with oral cancer.

Results: Males (63.3%), non-smokers (56.6%), betel quid chewers (96.6%), and residents of different sub-cities of Rajasthan made up the bulk of oral cancer cases. The majority of patients were in stages III (30%) and IV (45%) at the time of diagnosis. The most often used type of therapy was a surgical, radiation, or combination. The majority of the patients were still living (73%) at the time of this study.

Conclusion: The gingivobuccal sulcus (GBS) complex malignancy was the most frequently involved oral cavity site (33%), and oral squamous cell carcinoma (OSCC) was the most commonly encountered oral cancer in the Rajasthan population (73.3%).

Keywords: Gingivobuccal sulcus complex carcinoma, Oral cancer, Radiotherapy, Squamous cell carcinoma.

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INTRODUCTION

Incidence and mortality rates of oral cancer have increased globally, particularly in developing nations, and this is concerning.¹ Oral cavity cancer is the 10th most prevalent cancer overall and the leading cause of death, according to the World Health Organization (WHO).² Around the world, 405,000 new cases of oral cancer are reported each year, with the highest incidence rates occurring in Sri Lanka, India, Pakistan, Bangladesh, Hungary, and France.³

As opposed to tongue carcinoma, which is more common in Western countries, the gingival-buccal complex (alveolar ridge, gingival-buccal sulcus, and buccal mucosa) is the most common site for oral cancer in India.⁴ In India, men are more likely than women to get oral cavity cancer, with men: women ratio of 2:1.⁵

According to studies, oral cancer in men is influenced by lifestyle and deleterious habits such as smoking, chewing betel nuts, drinking alcohol, and having pre-existed conditions like premalignant lesions or other problems.⁶ Despite numerous substantial advancements in diagnostic and therapeutic procedures, the age-standardized death rates (5.2 per 100,000 in India) have remained stable.⁷

The overall 5-year survival rate for oral cancer is around 60%. In comparison, localized cancers have a superior rate of 82.8% compared to regional tumors at 51.8% and distant tumors at 27.8%.⁸ Squamous cell carcinoma is the most frequent histological kind of cancer (occurring 90% of the time).⁹ The position of the initial tumor, the tumor size (T stage), the nodal metastases (N stage), and the extracapsular dissemination of the primary tumor all decide the treatment options, such as radiotherapy (RT), chemotherapy (CT), surgery, or a combination of these.¹⁰

There have been numerous studies on the epidemiology of oral cancer in various regions of India, so this study was conducted to examine the socio-demographic and clinicopathological risk factors that are linked to oral cancer in Rajasthan, north India, as

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well as the distribution of oral cancer in various anatomic sites of the oral cavity.

MATERIALS AND METHODS

In this retrospective cross-sectional investigation, 300 patients with oral cancer were included, along with information on their demographics, clinicopathological features, and treatment options. The study was conducted at Mahatma Gandhi Medical College & Hospital (MGMCH), Jaipur, Rajasthan. The data was collected from the medical record office of MGMCH between January 2016 and 2018. Records with missing data were excluded.

For data analysis to calculate the absolute and relative frequencies, descriptive statistic package for the social sciences

Table 1: Socio-demographic characteristics of patients with oral cancer

Variables	Percentage (%)
Age (Years)	54.0 (Mean)
Male	190 (63.3%)
Female	110 (36.6%)
Tobacco consumption	
Smokers	130 (43.3%)
Non-smokers	170 (56.6%)
Alcohol intake	
User	55 (18.3%)
Non-user	245 (81.6%)
Betel quid	
User	290 (96.6%)
Non-user	10 (3.3%)
Past family history	
Yes	50 (16.6%)
No	250 (83.3%)
Viral (HPV) factor	
Yes	55 (18.3%)
No	245 (81.6%)

Statistical Package for the Social Sciences (SPSS version 24.0 IBM, Armonk, NY: IBM Corp, USA).

RESULTS

Out of 320 registered oral cancer cases, 20 oral cancer patients were excluded due to missing records, hence 300 patients were included.

Socio-demographic Characteristics

The average age was 54. The majority of participants (81.6%), were male (63.3%), non-smokers (56.6%), and betel quid chewers (96.6%) (Table 1).

The majority of the diagnosed case was at stage III and IV (30% and 45%) with locoregional or distant metastasis 66% and without metastasis, 33% were recorded. Depending upon there severity of the disease people were managed with combined treatment, i.e., Surgery followed by RT (26.6%) or concurrent chemo-RT post-surgery (10%) (Table 2).

The commonest site of occurrence was the gingivobuccal sulcus (GBS) involving buccal mucosa of the oral cavity. After the GBS site (33.3%), tongue (23%), buccal mucosa (16.6%), floor of mouth (13.3%), lips (6.6%), and then major salivary gland (3.3%) (Table 3).

In Rajasthan, oral squamous cell carcinoma (OSCC) was the most often reported malignancy (73.3%) (Table 4).

In duration of 2 years from 2016–2018, 250 (83.3%) of the patient received treatment, while 50 patients (16.6%) did not receive any of the treatment. About 200 patients (66.6%) underwent treatment and survived whereas, 30 patients (10%) refused the treatment and were dead (33.3%) (Table 5).

DISCUSSION

It has been widely noted that the risk of oral cancer increases with age, especially beyond the age of 40. In this study, the average age was 54 years.¹¹ Histopathological, lesions from various entities, such

Table 2: Clinical and pathological characteristics of patients with oral cancer

Variables	N (%)
T Classification	
T1	30 (10%)
T2	45 (15%)
T3	90 (30%)
T4	135 (45%)
N Classification	
N0	40 (13.3%)
N1	130 (43.3%)
N2	45 (15%)
N3	85 (28.3%)
M Classification	
M0	100 (33%)
M1	200 (66%)
TNM Staging	
Stage I	32 (10.6%)
Stage II	43 (14.3%)
Stage III	90 (30%)
Stage IV	135 (45%)
Treatment	
Surgery	40 (13.3%)
Surgery + Chemotherapy	18 (6%)
Surgery + Radiotherapy	80 (26.6%)
Surgery + Chemotherapy + Radiotherapy	30 (10%)
Radiotherapy	40 (13.3%)
Radiotherapy + Chemotherapy	30 (10%)
Chemotherapy	10 (3.3%)
No treatment	52 (17.3%)
Survival status	
Alive	200 (66.6%)
Dead	100 (33.3%)

Table 3: shows the distribution of Oral cancer by different anatomic sites

Oral cancer anatomic site	N (%)
Tongue	70 (23%)
Buccal mucosa	50 (16.6%)
Gingivobuccal sulcus complex (GBS complex)	100 (33.3%)
Lips	20 (6.6%)
Glands	10 (3.3%)
Floor of mouth	40 (13.3%)
Palate	10 (3.3%)

as epithelial, glandular, and mesenchymal, can appear at any age, with men being more likely to develop them than women (male ratio: 1.6 to 1). Our study has connections to Asian nations like Pakistan and Africa.¹²

In our investigation, we discovered that OSCC affected 73.3% (220 individuals). Our investigation displayed the malignancy

Table 4: Lists many histopathologically derived types of oral cancer lesions

Histopathological origin	Site of distribution	N (%)
Epithelial origin (N%)		
Squamous cell carcinoma, 220 (73.3%)	Tongue	54 (18%)
	Buccal mucosa	38 (12.6%)
	GBS complex	75 (25%)
	Floor of mouth	20 (6.6%)
	Gland	8 (2.6%)
	Lips	17 (5.6%)
	Palate	8 (2.6%)
Basal cell carcinoma, 15 (5%)	Lips	10 (3.3%)
	Gland	5 (1.6%)
Glandular origin		
Mucoepidermoid carcinoma, 5 (1.6%)	Parotid gland	3 (1%)
	Submandibular gland	2 (0.6%)
Adenoid cystic carcinoma, 2 (0.6%)	Submandibular gland	1 (0.3%)
	Parotid gland	1 (0.3%)
Adenocarcinoma, 3 (1%)	Parotid gland	2 (0.6%)
	Submandibular gland	1 (0.3%)
Mesenchymal origin		
Rhabdomyosarcoma, 5 (1.6%)	Buccal mucosa	2 (0.6%)
	Lip	1 (0.3%)
	Tongue	1 (0.3%)
	GBS complex	1 (0.3%)
Leiomyosarcoma, 10 (3.3%)	Tongue	4
	Lip	1 (0.3%)
	Palate	1 (0.3%)
	GBS complex	2 (0.6%)
	Buccal mucosa	1 (0.3%)
	Parotid gland	1 (0.3%)
	B-cell lymphoma, 20 (6.6%)	Tongue
Osteosarcoma, 20 (6.6%)	Buccal mucosa	2 (0.6%)
	GBS complex	10 (3.3%)
	Palate	5 (1.6%)
	Maxilla	8 (2.6%)
	Mandible	12 (4%)

Table 5: The status of patients with oral cancer's treatment outcomes

Treatment	Surviving	Dead	Total
Yes	200 (66.6%)	50 (16.6%)	250 (83.3)
No	20 (6.6%)	30 (10%)	50 (16.6%)
Total	220 (73.3%)	80 (26.6%)	300 (100%)

according to the location of the tumor. The GBS is involved in buccal mucosa cancer, which is consistent with a number of other investigations.¹³ This is a result of an unhealthy habit that the Indian population has, which involves the chew tobacco or betel quid and placing it between their teeth and buccal mucosa.

The highest number of patients with T3 (30%) and T4 Stages (45%) are included in our current study. The 17.3% of patients with stage T4 cancer were in an inoperable state and did not receive any treatment. Numerous other investigations detailed their findings using various classification methods, histological reports, treatment type (benign or malignancy), cancer site, differentiation grade, and involved region.¹⁴⁻¹⁷

According to the recommendations of the National Comprehensive Cancer Network (NCCN), patients in our study received a combination of treatment modalities, such as surgery and radiation therapy. The NCCN recommendations state that surgery and radiation therapy are the recommended treatments for early-stage cancer or T1/T2 cancer. The majority of cancer specialists favor resection over elective neck dissection.¹⁷ Oral cancer in the initial stage can be controlled locally and regionally with RT, either external beam or brachytherapy, or both.¹⁸ Although, it is impossible to compare the surgical and radiation treatment techniques side by side. According to Huang et al.'s retrospective research of 148 patients in T1/T2, N0 disease, clear margins following surgical resection, with more than 90% loco-regional control, are seen.¹⁹

Surgical resection can prevent the effects of RT such as post-RT-poor quality of life, xerostomia, dysphagia, and osteoradionecrosis, and extended treatment followed by late recovery.²⁰ For all oral cancer patients, surgery should be the primary form of treatment, with advanced cases like T3, and T4 receiving radiation therapy after surgery and only patients who are inoperable receiving definitive radiation therapy. This study emphasizes the rise in oral cancer along with its management in Rajasthan, India.

CONCLUSION

In conclusion, the significant relation between OSCC and middle age, low socioeconomic status, and tobacco chewing with smoking increases the higher risk for oral cancer development. Gingivobuccal sulcus complex is the most common site for the occurrence of oral cancer as tobacco or betel nut chewing is very common in routine in the population of Rajasthan. The clinicopathological profile of OSCC was well differentiated from SCC with the clinical stage of TNM stage III, and IV. Hence, it is important to carry out and promote oral cancer screening for early diagnosis and its management.

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REFERENCES

- Dantas TS, deBarros Silva PG, Sousa EF, et al. Influence of educational level, stage, and histological type on survival of oral cancer in a Brazilian population: A retrospective study of 10 years observation. *Medicine (Baltimore)* 2016;95(3):e2314. DOI: 10.1097/MD.0000000000002314.
- Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68(6):394-424. DOI: 10.3322/caac.21492.
- Ferlay J, Shin HR, Bray F, et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer* 2010;127(12):2893-2917. DOI: 10.1002/ijc.25516.
- Pathak KA, Gupta S, Talole S, et al. Advanced squamous cell carcinoma of lower gingivobuccal complex: Patterns of spread and failure. *Head Neck* 2005;27:597-602. DOI: 10.1002/hed.20195.

5. Dikshit R, Gupta PC, Ramasundarathettige C, et al. Cancer mortality in India: A nationally representative survey. *Lancet* 2012; 379(9828):1807–1816. DOI: 10.1016/S0140-6736(12)60358-4.
6. Crăcană A, Şulea D, Nicolau A, et al. Risk factors in the emergence of oral cancer – Retrospective study. *Roman J Oral Rehabil* 2016;8(3):48–63. Available from: <https://www.rjor.ro/wp-content/uploads/2016/11/risk-factors-in-the-emergence-of-oral-cancer---retrospective-study1.pdf>.
7. Cancer Research UK. Available at: <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/oral/uk> (accessed on 1 Mar 2013).
8. Ferlay J, Shin HR, Bray F, et al. GLOBOCAN 2008 v2.0, Cancer incidence and mortality worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available at <http://globocan.iarc.fr> (accessed on 1 Mar 2013)
9. Mendez M, Carrard VC, Haas AN, et al. A 10-year study of specimens submitted to oral pathology laboratory analysis: Lesion occurrence and demographic features. *Braz Oral Res* 2012;26(3):235–241. DOI: 10.1590/s1806-83242012000300009.
10. Gupta B, Johnson NW. Oral cancer: Indian pandemic. *Br Dent J* 2017;222(7):497. DOI: 10.1038/sj.bdj.2017.293.
11. Mehrotra R, Singh M, Kumar D, et al. Age specific incidence rate and pathological spectrum of oral cancer in Allahabad. *Indian J Med Sci* 2003;57(9):400–404. PMID: 14515030.
12. Honorato J, Rebelo MS, Dias FL, et al. Gender differences in prognostic factors for oral cancer. *Int J Oral Maxillofac Surg* 2015;44(10):1205–1211. DOI: 10.1016/j.ijom.2015.04.015.
13. Warnakulasuriya S. Living with oral cancer: Epidemiology with particular reference to prevalence and life-style changes that influence survival. *Oral Oncol* 2010;46(6):407–410. DOI: 10.1016/j.oraloncology.2010.02.015.
14. Chen YK, Huang HC, Lin LM, et al. Primary oral squamous cell carcinoma: An analysis of 703 cases in southern Taiwan. *Oral Oncol* 1999;35(2):173–179. DOI: 10.1016/s1368-8375(98)00101-8.
15. Horowitz AM, Nourjah PA. Factors associated with having oral cancer examinations among US adults 40 years of age or older. *J Public Health Dent* 1996;56(6):331–335. DOI: 10.1111/j.1752-7325.1996.tb02460.x.
16. Khammissa RA, Meer S, Lemmer J, et al. Oral squamous cell carcinoma in a South African sample: Race/ethnicity, age, gender, and degree of histopathological differentiation. *J Cancer Res Ther* 2014;10(4):908–914. DOI: 10.4103/0973-1482.138100.
17. Marur S, Forastiere AA. Head and neck squamous cell carcinoma: Update on epidemiology, diagnosis, and treatment. *Mayo Clin Proc* 2016;91(3):386–396. DOI: 10.1016/j.mayocp.2015.12.017.
18. Delclos L, Lindberg RD, Fletcher GH. Squamous cell carcinoma of the oral tongue and floor of mouth. Evaluation of interstitial radium therapy. *AJR Am J Roentgenol* 1976;126(2):223–228. DOI: 10.2214/ajr.126.2.223.
19. Huang T-Y, Hsu L-P, Wen Y-H, et al. Predictors of locoregional recurrence in early stage oral cavity cancer with free surgical margins. *Oral Oncol* 2010;46(1):49–55. DOI: 10.1016/j.oraloncology.2009.10.011.
20. Genden EM, Ferlito A, Silver CE, et al. Contemporary management of cancer of the oral cavity. *Eur Arch Otorhinolaryngol* 2010; 267(7):1001–1017. DOI: 10.1007/s00405-010-1206-2.