

Clinicopathological Analysis of Oral Squamous Cell Carcinoma among the Younger Age Group Admitted to Tertiary Care Hospital, Karamsad, Gujarat, India

FARUQ IBRAHIMBHAI MULLA¹, JAIMIN JAGDISHBHAI PATEL², KINJAL JITENDRABHAI SAGATHIYA³

ABSTRACT

Introduction: In India, chewing pan, use of commercial tobacco products, beedi, cigarette smoking, alcohol drinking and use of snuff are some of the common habits. Although several studies have been focused on aetiology and clinicopathological features of Oral Squamous Cell Carcinoma (OSCC) in the Indian population but very few studies have been conducted with reference to the incidence of OSCC in a younger age group.

Aim: To assess clinicopathological profile of OSCC in younger (<45 years age group of) patients.

Materials and Methods: This retrospective study was carried out at the Shree Krishna Hospital, Karamsad, Gujarat, India. All OSCC patients (1517) who were admitted in the hospital between January 2015 to December 2018 were included in the study. The case history and biopsy report files were retrieved from the data storage system of the Shree Krishna hospital, Karamsad, Gujarat, India. The tumours were histopathologically graded by cell differentiation into well differentiated, moderately differentiated and poorly differentiated categories. The data was entered in MS Excel 2010. Statistical analysis was carried out

using EPI Info7. Quantitative data was presented with mean and Standard Deviation (SD) while qualitative data was presented with frequency and percentage. Chi-square and Fishers'-exact tests were used for qualitative data to check significant difference.

Results: Overall consumption rate of tobacco was 91.4% and quid was 62.9%. Habit of chewing quid was more frequently observed in young 297 (71.4%) than old patients 548 (59.1%). In young patients, buccal mucosa was the most common site for OSCC (226, 48.4%) followed by tongue (158, 33.8%). While in old patients, most common site was gingivo buccal sulcus (138, 40.4%) followed by tongue (72, 21.1%). Overall stage IVA (270, 45.0%) was most commonly observed pathological stage followed by stage III (125, 20.8%).

Conclusion: The present study indicates an increase in tobacco and pan chewing in young adults when compared to older individuals. Majority of the cases were in the advanced stages of the disease irrespective of the age. Screening programs for individuals at high risk of developing oral cancer including tobacco users are required for early and accurate diagnosis.

Keywords: Mouth mucosa, Neoplasms, *Papillomaviridae*, Tobacco

INTRODUCTION

The OSCC ranks among the top three cancers in India and is the eighth most common cancer worldwide. OSCC is typically diagnosed in fifth to seventh decade of life [1]. In India, OSCC remains a major public health concern where the consumption of tobacco in various forms, is the cause of high prevalence [2]. The age standardised incidence rate of oral cancer in younger patients is reported 2% in India [3]. The consumption of tobacco is also disproportionate and is higher among lower socio-economic strata of society [4], but according to recent studies additional conditions such as chronic inflammation, genetic alterations, and viral infection may be other predisposing factors to young and very elderly adult patients [5]. Although, it is known that the incidence of oral cancer increases with age, there is an increasing trend of incidence in young males [6]. A similar trend has also been observed in females who never consumed alcohol or tobacco [7]. Several key factors are responsible for the regular use of tobacco by the youth including exposure to parental, sibling and peer smoking, easy access to smoking and non smoking forms of tobacco, aggressive promotion and advertising [8]. In the oropharynx, as many as 70% of squamous cell carcinoma, particularly those involving the tonsils, the base of the tongue, and the pharynx, harbour oncogenic variants of human papilloma virus [8]. The squamous carcinoma usually occurs in older age group, so most of the studies revealed the incidence rates in

older age [1]. This study was conducted to reveal incidence of squamous carcinoma in young population.

MATERIALS AND METHODS

This hospital-based retrospective study was carried out at Shree Krishna Hospital, Karamsad, Gujarat to identify clinicopathological profile of OSCC of oral cavity among the younger age group. Retrospective data of four years (January 2015 to December 2018) was collected from hospital records and analysis of the data was done in August 2020. Approval of the Institutional Ethical Committee was taken (ethics committee approval no IEC/HMPCMCE/108/FACULTY/11/166/19).

Inclusion and Exclusion criteria: Pathologically confirmed cases of squamous cell carcinoma of the lip (International Classification of Diseases (ICD)-10 site code C00), intraoral sites (ICD-10 C01-C06) and oropharynx/tonsil (ICD-10 C09 and C10) were included. Patients with malignancies of the salivary glands, nasopharynx and hypopharynx and metastatic tumours were excluded from the study. The case history and biopsy report files were retrieved from the data storage system of the Shree Krishna hospital, Karamsad. Age ≤45 years were considered as younger according previous study [9]. The study included pathologically confirmed cases of the lip, intraoral site, and oropharyngeal tonsil in less than 45 years of age. The malignancies of salivary gland, nasopharynx, hypo pharynx and metastasis and more than 45 years of age patients were excluded.

STATISTICAL ANALYSIS

The data was entered in MS Excel 2010. Statistical analysis was carried out using EPI Info7. Quantitative data was presented with mean and SD while qualitative data was presented with frequency and percentage. Chi-square and Fishers-exact tests were used for qualitative data to check significant difference. The p-value <0.05 was considered as statistically significant.

RESULTS

A total of 1517 cases diagnosed with OSCC during the duration of the study were selected from online help desk software, medical record department. A summary of location of tumour for oral cancer cases is shown in [Table/Fig-1] overall consumption rate of tobacco was 91.4% (1228) and quid was 62.9% (845). Habit of chewing quid was more frequently observed in young (71.4%) than old patients (59.1%). In young patients, buccal mucosa was the most common site for OSCC 226 (48.4%) followed by tongue 158 (33.8%). While in old patients, most common site was gingivo buccal sulcus 138 (40.4%) followed by tongue 72 (21.1%).

	<45 year (n=467)	>45 year (n=342)	Total (n=809)	
Location	n (%)	n (%)	n (%)	p-value
Buccal mucosa	226 (48.4%)	47 (13.7%)	273 (33.7%)	<0.001*
Tongue	158 (33.8%)	72 (21.1%)	230 (28.4%)	
Gingivo buccal sulcus	18 (3.9%)	138 (40.4%)	156 (19.3%)	
Alveolar ridge	17 (3.6%)	67 (19.6%)	84 (10.4%)	
Retromolar trigone	11 (2.4%)	16 (4.7%)	27 (3.3%)	
Palate	17 (3.6%)	2 (0.6%)	19 (2.3%)	
Lip	13 (2.8%)	0	13 (1.6%)	
Tonsillar	3 (0.6%)	0	3 (0.4%)	
Floor of mouth	3 (0.6%)	0	3 (0.4%)	
Central arch of mandible	1 (0.2%)	0	1 (0.1%)	

[Table/Fig-1]: Comparison of location of OSCC between young and old age groups (n=809).

*Chi-square test was applied

The comparison of socio-demographic characteristics having OSCC is shown in [Table/Fig-2]. Similarly, comparison of types of growth and tumour differentiation is shown in [Table/Fig-3,4]. Overall stage IVA 270 (45.0%) was most commonly observed pathological stage followed by stage III 125 (20.8%) [Table/Fig-5].

Characteristics	<45 year (n=469)	>45 year (n=1048)	Total (n=1517)	p-value
Age	38.5±5.1	59.3±8.7	52.8±12.3	<0.001*
Gender				
Male	398 (84.9%)	801 (76.4%)	1199 (79.0%)	0.002*
Female	71 (15.1%)	247 (23.6%)	318 (21.0%)	
M:F ratio	5.6: 1	3.2: 1	3.8: 1	
Addiction				
Present	416 (89.1%)	927 (88.5%)	1343 (88.5%)	0.72*
Absent	51 (10.9%)	121 (11.5%)	174 (11.5%)	
Type of addiction	(n=416)	(n=927)	(n=1343)	
Tobacco	358 (86.1%)	870 (93.9%)	1228 (91.4%)	<0.001*
Chewing quid	297 (71.4%)	548 (59.1%)	845 (62.9%)	
Smoking	55 (13.2%)	377 (40.7%)	432 (32.2%)	
Alcohol	71 (17.1%)	124 (13.4%)	195 (14.5%)	
Chhikani	32 (7.7%)	57 (6.1%)	89 (6.6%)	
Other	5 (1.2%)	0 (0%)	5 (0.4%)	

[Table/Fig-2]: Socio-demographic characteristics of patients (n=1517).

*Unpaired t-test; *Chi-square test; *Fisher-exact test were applied

Type of growth	<45 year (n=318)	>45 year (n=991)	Total (n=1309)	p-value
Ulcer proliferative growth	165 (51.9%)	437 (44.1%)	602 (46.0%)	<0.001*
Ulcerative	60 (18.9%)	403 (40.7%)	463 (35.4%)	
Ulcer infiltrative growth	83 (26.1%)	146 (14.7%)	229 (17.5%)	
Exophytic	4 (1.3%)	2 (0.2%)	6 (0.5%)	
Verrucous	4 (1.3%)	1 (0.1%)	5 (0.4%)	
Fungating	2 (0.6%)	2 (0.2%)	4 (0.3%)	

[Table/Fig-3]: Comparison of type of growth between young and old age groups (n=1309)*.

*Out of 1517 patients, data for growth was available for 1309 patients; *Fisher-exact test was applied

Diagnosis	≤45 year (n=469)	>45 year (n=1048)	Total (n=1517)	p-value
Well differentiated	233 (49.7%)	456 (43.5%)	689 (45.4%)	<0.001*
Moderately differentiated	206 (43.9%)	494 (47.1%)	700 (46.1%)	
Poorly differentiated	10 (2.1%)	38 (3.6%)	48 (3.2%)	
Undifferentiated	12 (2.6%)	59 (5.6%)	71 (4.7%)	
Verrucous carcinoma	8 (1.7%)	1 (0.1%)	9 (0.6%)	

[Table/Fig-4]: Comparison of tumour differentiation between young and old age groups (n=1517).

*Chi-square test

Stage	<45 year (n=260)	>45 year (n=340)	Total (n=600)	p-value
I	29 (11.2%)	47 (13.8%)	76 (12.7%)	0.002*
II	41 (15.8%)	72 (21.2%)	113 (18.8%)	
III	58 (22.3%)	67 (19.7%)	125 (20.8%)	
IVA	132 (50.8%)	138 (40.6%)	270 (45.0%)	
IVB	0 (0%)	16 (4.7%)	16 (2.7%)	

[Table/Fig-5]: Comparison of pathological staging between young and old age groups (n=600)*.

*Out of 1517 patients; data of pathological staging was available of 600 patients; *Fisher-exact test was applied

DISCUSSION

Earlier most of the study was done for incidence rate of oral cancer in older age. The present study was about incidence rate of oral cancer in younger (<45 years) age group.

Three fourth patients (74.6%) in present study were between the age group of 41-70 year. The male:female ratio in present study was 5.6:1 which was relatively higher as compared to the studies done by Chitapanarux I et al., Llewellyn CD et al., Singh MP et al., Friedlander PL et al., in which the ratio was 1.5:1, 2.5:1, 2.7:1 and 1.8:1 respectively [10-13]. It concludes that the prevalence of OSCC is more commonly observed in the male gender due to various socio-economic norms of the society.

In present study, the overall consumption rate of tobacco was 91.4% and quid was 62.9%. Tobacco was most common addiction in both age groups (young-86.1% v/s old-93.9%). Habit of chewing quid was more observed in young 71.4% than old patients 59.1%. Similarly smoking was more prevalent in old 40.7% than young patients. The other study included here shows almost similar result in between 74-80%, regarding cases with tobacco consumption. Buccal mucosa was the most common site for OSCC (48.4%) followed by tongue (33.8%), while in old patients, most common site is gingivo buccal sulcus (40.4%) followed by tongue (21.1%). The findings of which matches that of the study done by Friedlander PL et al., which on contrary, the studies done by Chitapanarux I et al., Llewellyn CD et al., and Singh MP et al., shows the most common site to be the tongue [10-12]. Comparison of study findings with various studies is shown in [Table/Fig-6] [10-13].

In the present study, the overall, stage IVA (45.0%) was the most commonly observed pathological stage followed by stage III (20.8%). In young and old patients, stage IVA is most commonly observed pathological stage followed by stage III.

Study	M:F ratio	Smoking	Tobacco	Alcohol	Most common location	Most common stage	Most common diagnosis
Friedlander PL et al., [13] New York, 1997	1.8:1	23.4%	87.6%	16.2%	Buccal mucosa	IVA	W
Llewellyn CD et al., [11] South England, 2001	2.5:1	31.2%	79.3%	13.4%	Tongue	III	M
Chitapanarux I et al., [10] Thailand, 2006	1.5:1	27.3%	76%	23%	Tongue	III	M
Singh MP et al., [12] Lucknow, 2015	2.7:1	34.5%	74.3%	14.3%	Tongue	III	M
Present study, Karamsad, 2021	5.6: 1	13.2%	86.1%	17.1%	Buccal mucosa	IVA	M

[Table/Fig-6]: Comparison between various studies among young patients (<45 years) [10-13]. W-Well differentiated; M-Moderately differentiated

Limitation(s)

The limitation of this study was that there was no long term follow-up of the patient.

CONCLUSION(S)

Current study indicates that a significant proportion (31.1%) of all OSCC cases was observed in patients of 45 years or younger. The study indicates an increase in tobacco and pan chewing in young adults when compared to older individuals. The present study suggests that presentation of most of cases in advanced stage is because of lack of awareness, ignorant, and lower socio-economic status.

Acknowledgement

The author would like to express his sincere gratitude to Dr. Keyuri Patel (Head and Professor, Department of Pathology, Pramukh Swami Medical College) for encouraging this study, extending her help and constant guidance and co-operation. The author is to Dr. Monica Gupta (Professor, Assistant Dean, Clinical Excellence and Accreditation, PS Medical College and Shree Krishna Hospital) for their suggestions throughout the study. He would like to thank wholeheartedly to the study participants without whom this study would not have been completed.

REFERENCES

- [1] Chen S, Lin Z, Chen J, Yang A, Zhang Q, Xie C, et al. Older age is a risk factor associated with poor prognosis of patients with squamous cell carcinoma of the oral cavity. *Eur Arch Otorhinolaryngol.* 2020;277(9):2573-80.
- [2] Abdulla R, Adyanthaya S, Kini P, Mohanty V, D'Souza N, Subbannayya Y. Clinicopathological analysis of oral squamous cell carcinoma among the younger age group in coastal Karnataka, India: A retrospective study. *J Oral Maxillofac Pathol.* 2018;22(2):180-87.
- [3] Sharma S, Satyanarayana L, Asthana S, Shivalingesh KK, Goutham BS, Ramachandra S. Oral cancer statistics in India on the basis of first report of 29 population-based cancer registries. *J Oral Maxillofac Pathol.* 2018;22(1):18-26.
- [4] Shah S, Dave B, Shah R, Mehta TR, Dave R. Socioeconomic and cultural impact of tobacco in India. *J Family Med Prim Care.* 2018;7(6):1173-76.
- [5] Fu JY, Wu CX, Zhang CP, Gao J, Luo JF, Shen SK, et al. Oral cancer incidence in Shanghai a temporal trend analysis from 2003 to 2012. *BMC Cancer.* 2018;18(1):686.
- [6] Furman D, Campisi J, Verdin E, Carrera-Bastos P, Targ S, Franceschi C, et al. Chronic inflammation in the etiology of disease across the life span. *Nat Med.* 2019;25(12):1822-32.
- [7] Vivek B, Konwar Aditya N, Pronamika B. Oral cancer diagnosis and perspectives in India. *Sensors International.* 2020;1:100046.
- [8] Ghose S, Sardar A, Shiva S, Mullan BE, Datta SS. Perception of tobacco use in young adults in urban India: A qualitative exploration with relevant health policy analysis. *e-cancer.* 2019;13:915.
- [9] Hussein AA, Helder MN, de Visscher JG, Leemans CR, Braakhuis BJ, de Vet HCW, et al. Global incidence of oral and oropharynx cancer in patients younger than 45 years versus older patients: A systematic review. *Eur J Cancer.* 2017;82:115-27.
- [10] Chitapanarux I, Lorvidhaya V, Sittitirai P, Pattarasakulchai T, Tharavichitkul E, Sriuthaisirirong P, et al. Oral cavity cancers at a young age: Analysis of patient, tumour and treatment characteristics in Chiang Mai University Hospital. *Oral Oncol.* 2006;42(1):83-88.
- [11] Llewellyn CD, Johnson NW, Warnakulasuriya KA. Risk factors for squamous cell carcinoma of the oral cavity in young people-A comprehensive literature review. *Oral Oncol.* 2001;37(5):401-18.
- [12] Singh MP, Misra S, Rathanaswamy SP, Gupta S, Tewari BN, Bhatt ML, et al. Clinical profile and epidemiological factors of oral cancer patients from North India. *Natl J Maxillofac Surg.* 2015;6(1):21-24.
- [13] Friedlander PL, Schantz SP, Shaha AR, Yu G, Shah JP. Squamous cell carcinoma of the tongue in young patients: A matched-pair analysis. *Head Neck.* 1998;20(5):363-68.

PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Surgical Pathology, Pramukh Swami Medical College, Anand, Gujarat, India.
2. Third Year Resident, Department of Surgical Pathology, Pramukh Swami Medical College, Anand, Gujarat, India.
3. Second Year Resident, Department of Surgical Pathology, Pramukh Swami Medical College, Anand, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Faruq Ibrahimhai Mulla,
C/o Dr. I. I. Malla, 16, Royal Society, Near Pleasant Hotel and Gamdi Overbridge,
Near Samarkha Chowkdi, Anand-388001, Gujarat, India.
E-mail: drfm24@gmail.com

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? No
- For any images presented appropriate consent has been obtained from the subjects. No

PLAGIARISM CHECKING METHODS: (Jain H et al.)

- Plagiarism X-checker: Jan 14, 2021
- Manual Googling: Jun 18, 2021
- iThenticate Software: Jul 03, 2021 (12%)

ETYMOLOGY: Author Origin

Date of Submission: **Jan 11, 2021**
Date of Peer Review: **Feb 04, 2021**
Date of Acceptance: **Jun 18, 2021**
Date of Publishing: **Oct 01, 2021**