



Generational Shift in behavior of Oral Cancer: A clinicopathologic study

Sunita Pathak, Dr. Prateek Singh, Ravi Kumar Seth, Sherin N
Rama Dental College Hospital & Research Centre, Rama University, Mandhana, Kanpur, UP;
drsunitapathak.rdc@ramauniversity.ac.in

Abstract

Aim of the Study: To study the cases of Oral squamous cell carcinoma (OSCC) reported at our institution with particular focus on the demographic and clinicopathologic variables in young adults.

Setting and Design: It was a retrospective study of OSCC cases reported in the institution over the last decade i.e. from 2010 to 2019.

Materials and Methods: Demographic and histopathologic data of oral cancer cases reported between 2010 and 2019 were retrieved from the records. Mean cut-off age for cases to be considered as those in young adults was set at 45 years or below and this formed the focus group of the study. The data obtained was tabulated and a comparative analysis was done for the focus group as compared to oral cancer cases in older population.

Results: Results showed an increasing incidence of OSCC among young adults. The demographic and anatomic location of these cases showed significant variations from cases of oral cancer in older patients.

Conclusion: The findings of our study indicate an increasing incidence of oral cancer among young adults in our region. The tongue and Retromolar Trigone (RMT) are the most common sites in these cases and even young patients had a history of long standing substance abuse including chewing tobacco and gutka/pan masala products. This indicates to a lack of or failure of governmental policies on the sale of such products leading to a generational shift in oral cancer from being a disease of the old to that of the young.

Key words: Histopathology, oral squamous cell carcinoma, Oral cancer, Tongue, Retromolar trigone

DOI Number: 10.48047/nq.2020.18.6.NQ20192

NeuroQuantology 2020;18(6):121-127

List of Abbreviations

1. OSCC – Oral Squamous cell carcinoma
2. RMT – Retromolar Trigone
3. PMD – Potentially malignant disorders

List of Tables

1. Table 1: Total OSCC cases from 2014 to 2023
2. Table 2: Sex distribution of the oral squamous cell carcinoma cases
3. Table 3: Sitewise Distribution of OSCC in the Groups

List of Figures

1. Graph 1: Relative Proportion of Young patients to Old in the Study Period

Introduction

Oral squamous cell carcinoma (OSCC) is one of the most common type of malignancies seen in the developing world. The problem is particularly rampant in South-east Asian countries, particularly ours. As per the latest reports from the National Cancer Registry Programme, Oral cancer ranks 3rd overall among all cancers reported in males and 6th most common type of cancer in females.¹

Given the fact that India is now among the most populous countries in the world, this high incidence of oral cancer in a matter of grave concern not just for our country but the whole world. The reasons for this sustained high numbers of oral cancer in India are manifold. Socio-cultural traditions, economic factors and the level of education and awareness are just some of these reasons.

Oral cancer is unique among the multitude of cancers that afflict the mankind. Most often, it is preceded by visible and easily treatable pre-cancerous changes in the oral mucosa that are recognized by the WHO as Potentially malignant disorders (PMD). These PMDs if caught early and treated in time can be completely eliminated or at least managed to such an extent that transformation to cancer would almost never occur. However, even with a whole plethora of both traditional and advanced diagnostic methods available to us, the grim statistics of oral cancer related morbidity and mortality point to a sorry state of affairs.

Traditionally, oral cancer is a disease mainly affecting the older age group. This has generally been attributed to indiscriminate substance abuse, particularly the use of tobacco and related products, over a considerable period of time.

The past decade or so however has shown an increasing incidence of oral cancer among young adults.^{2,3} The present study therefore intended to study the cases of OSCC

reported at our department over the last 10 years with emphasis on the demographic and clinicopathologic variables of oral cancer in young adults.

Materials and Methods

The department archives were studied and data of Oral squamous cell carcinoma cases reported between January, 2010 and December, 2019 was retrieved. The cases were grouped by age, with cases in patients below 45 years of age forming a separate study group. The age, sex, site, clinical presentation and histological characteristics of these cases were tabulated and analyzed. The histories of the patients in the study group were studied in detail for the presence of any deleterious oral habits or any other predisposing factors. The data obtained was tabulated and simple comparative analyses was done the various observed variables between the two groups: older patients (more than 45 years of age) and younger patients (45 years or below).

Results

The data obtained showed that the overall incidence of OSCC reported in the department increased from 98 cases in 2010 to 165 cases in 2019 [Table 1].

A total of 1141 cases of oral cancer were reported during the study period. Of these, 170 cases were those in younger patients under 45 years of age. The year-wise break-up showed that from 11 cases of OSCC in young patients in the year 2010, the numbers gradually increased to 28 in the year 2019 [Table 1].

OSCC in young patients accounted for 11.22% of the total number of cases in 2010. This percentage had increased more or less steadily to 16.9% in 2019 [Graph 1]. The mean

122

incidence of OSCC in young patients during this period is 14.58%, which is very high compared to previous literature.^[2,3,4]

The cases of oral cancer in young patients were mostly seen in the fourth to fifth decade of life. The disease showed greater prevalence in males compared to females (65%). This skewed gender ratio became even more lopsided in the young patients group. Almost 90% of the cases in this group occurred in males [Table 2].

The most common site for oral cancer in the older age group was the buccal mucosa (37%), followed by tongue (21%) and gingiva (20%). In the younger age group, OSCC was most commonly seen on the tongue (35%), followed by the Retromolar Trigone (22%), buccal mucosa (13%) and floor of mouth (10%) [Table 3].

The probable etiologic agents associated with oral cancer were investigated in cases below 45 years of age. Tobacco use in either smoking or chewing form was present in 161 of the 170 cases in this group. The mean duration of the habit in these cases was 16.8 years at an average frequency of 5 to 6 times per day.

Well differentiated OSCC was the most common histologic type in both the older and younger age groups. In the older age group, it formed 61% of the cases while in young adults it accounted for 56% of the cases. Moderately differentiated OSCC accounted for 25% of the cases in the old group while it accounted for 28% of the cases in the young group. Poorly differentiated OSCC formed 14% of cases in the old group while it accounted for 16% of the cases in the young group.

Overall, our results showed a high incidence of oral cancer in young adults. The demographic and site-wise distribution of

these cases showed significant variations from those in OSCC of older patients. A significant number of the cases in the younger group also tended to be less differentiated than that in the older group, therefore indicating to more aggressive nature and poorer prognosis.

Discussion

OSCC as a disease has generally been associated with old age. However, the increased incidence of oral cancer among young adults was first highlighted by oral and maxillofacial as well as head and neck healthcare professionals in the late 1970's. Later, the fact that head and neck cancer, particularly tongue cancer, was escalating in young adults in North America and internationally, began to be recognized from retrospective studies performed in the late 1980's.^[5,6] In the United States, studies performed during a 20 year period beginning in the 1960's revealed that there was a near four-fold increase of oral cancer in males ages 30-39 in the State of Connecticut.^[3] Similarly, studies by Ribeiro *et al*^[7] and Iamaroon *et al*,^[8] also suggest high incidence of oral cancer in young adults.^[18]

This work was intended to study the demographic, clinical and histologic characteristics of oral cancer cases among young adults, reported at our institution over the last decade. The results showed that the overall incidence of oral cancer has been increasing over this period. This is in contradiction to reports from the West, where a decreasing or steady trend for OSCC has been observed.^[3] This points to the extent of the problem in our region and can be largely attributed to the rampant use of tobacco and related products prevalent here.

The reported incidence of oral cancer among young adults varies from 0.4-5.5%.^[2,5] Our study showed an average incidence rate of 14.58% during the last six years. This suggests a very high rate of oral cancer in this region which should be a cause for

concern. A study at Regional Cancer Centre, Thiruvananthapuram during 2001 put the incidence of OSCC among patients below 35 years at 2.8%.^[2] We observed a much higher incidence than this, but the difference in the patients' age-groups between the two studies has to be taken into account.

Demographic comparisons show that while oral cancer in older persons did show a male predilection, it was significantly more so in young adults where almost 9 out of 10 cases occurred in males. Previous reports also suggest a similar male predominance for oral cancer in young adults.^[2,3,18]

Clinically, the most common site for OSCC in young adults was seen to be the tongue, accounting for 35% of the cases, followed by the Retromolar Trigone (22%). This finding is in agreement with the previous literature on the subject.^[2-4,9]

The etiology of oral cancer in young is still poorly understood. Studies by Iype *et al*^[2,9] and Schantz *et al*,^[3] showed that a significant percentage of cases of OSCC in young adults were non-habitues. Our findings however showed chewing tobacco as the major culprit in a majority of these cases. The habit is widely prevalent in North India and such products are easily found on every street corner. Vulnerable and at risk young children, particularly boys, take to this habit quite early as is evidence by the fact that majority of the young patients had been using these products for more than 15 years.

Tobacco is the major risk factor implicated in oral cancer with numerous studies pointing to its role in the carcinogenic mechanism. The risk is directly related to the duration, frequency and form of tobacco usage. A very significant problem in our country is the increasing use of smokeless tobacco and related products, as pointed out by

Gupta *et al*.^[10] Their study showed that male chewers of betel quid with tobacco in case-control studies in India had relative risks of oral cancer varying between 1.8-5.8. Oral submucous fibrosis was also seen to be increasing due to the use of processed areca nut products.^[10] Alcohol consumption is also a recognized risk factor for oral cancer, particularly when combined with tobacco usage, where it has an additive effect. Rodriguez *et al*,^[11] found that oral cancer was associated with alcohol drinking in never smokers, and with tobacco smoking in moderate drinkers. They also suggested that heavy consumption of both alcohol and tobacco produced almost 48-fold increased risk in young people.

Human Papilloma Virus (HPV) is one such emerging risk factor associated with oral cancer. Studies by Li *et al* and Zhang *et al*, have suggested the role of HPV in oral cancer.^[12,13] Mostly, the high-risk strains like HPV 16/18 are implicated with high malignant potential,^[14] and their role needs to be understood better before conclusive assumptions can be made. Similarly, unlike certain other malignancies, the role of hereditary factors in oral cancer of young is debatable. The low incidence of family history of cancer in the study by Chitapanarux I *et al* also points to this effect.^[15] The possible influence of lifestyle and dietary factors on oral cancer risk is also an area of interest. The study of dietary factors by Rodriguez T *et al*, showed that green vegetables, fresh fruits and β -carotene had a favorable effect on upper digestive tract cancers. The estimated population attributable risks in their study group were 52% for low vegetable, 12% for low fruit, and 26% for low β -carotene intake.^[11]

The role of all these known and emerging risk factors for OSCC in young has to be further established. It is however highly

unlikely that only a single cause can be implicated and most cases in the young probably involve a combination of two or more of these factors.

The histopathologic analysis of the cases showed that majority of the cases had a well differentiated phenotype in both the older and young age groups. This suggests that histologically, OSCC in young adults is not very different from that in older patients. Some authors have suggested that cancer in young adults tends to be more frequently anaplastic resulting in a more aggressive behavior and poor prognosis.^[16] Garavello *et al*, found that tongue cancer in young patients was associated with significantly higher rates of recurrence and poorer survival rates.^[17] However, findings of Iype *et al* suggest that survival among young patients is almost similar to that in older patients and prognosis was more related to the TNM stage of the disease at diagnosis rather than the histologic grade.^[2]

Summary & Conclusion

The findings of our study indicate a high incidence of OSCC among young adults in our region. Tongue is the most common site in these cases followed by the RMT. Tobacco usage seems to be the main etiologic factor in this regard pointing to a failure in the government policies to curb this menace.

The problem of OSCC is very rampant in our country. The true extent of this can only be a matter of speculation as most studies on the subject are on a smaller scale and usually institution-based. Larger studies, both institution and community-based, will help to understand the true spectrum and nature of this disease and probably help devise effective strategies at controlling it.

References

1. Available from:

http://www.icmr.nic.in/ncrp/report_pop_2001-04/Chapter%2001-05%20Pages%201%20to%2053.pdf

2. Iype EM, Pandey M, Mathew A, Thomas G, Sebastian P, Nair MK. Oral cancer among patients under the age of 35 years. *J PostgradMed* 2001;47:171.
3. Schantz SP, Yu GP. Head and neck cancer incidence trends in young Americans, 1973-1997, with special analysis for tongue cancer. *Arch Otolaryngol Head Neck Surg* 2002;128:268-74.
4. Sankaranarayanan R, Mohideen MN, Nair MK, Padmanabhan TK. Etiology of oral cancer in patients \geq 30 years of age. *Br J Cancer* 1989;59:439-40.
5. Depue RH. Rising mortality from cancer of the tongue in young white males. *N Engl J Med* 1986;315:647.
6. Franchesci S, Levi F, Lucchini F, Negri E, Boyle P, La Vecchia C. Trends in cancer mortality in young adults in Europe, 1955-1989. *Eur J Cancer* 1994;30:2096-118.
7. Ribeiro AC, Silva AR, Simonato LE, Salzedas LM, Sundefeld ML, Soubhia AM. Clinical and histopathological analysis of oral squamous cell carcinoma in young people. *Br J Oral Maxillofac Surg* 2008
8. Iamaroon A, Pattanaporn K, Pongsiriwet S, Wanachantararak S, Prapayasadok S, Jittidecharaks S, *et al*. Analysis of 587 cases of oral squamous cell carcinoma in northern Thailand with a focus on young people. *Int J Oral Maxillofac Surg* 2004;33:84-8.
9. Mathew Iype E, Pandey M, Mathew A, Thomas G, Sebastian P, Krishnan Nair M. Squamous cell carcinoma of the tongue among young Indian adults. *Neoplasia* 2001;3:273-7.
10. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. *Respirology* 2003;8:419-31.
11. Rodriguez T, Altieri A, Chatenoud L, Gallus S, Bosetti C, Negri E, *et al*. Risk factors for

125

oral and pharyngeal cancer in young adults. *Oral Oncol* 2004;40:207–13.

12. Li SL, Kim MS, Cherrick HM, Doniger JP, Park NH. Sequential combined tumorigenic effect of HPV-16 and chemical carcinogens. *Carcinogenesis* 1992;13:1981-7.
13. Zhang ZF, Morgenstern H, Spitz MR, Tashkin DP, Yu GP, Marshall JR, *et al.* Marijuana use and increased risk of squamous cell carcinoma of the head and neck. *Cancer Epidemiol Biomarkers Prev* 1999;8:1071-8.
14. Fregonesi PA, Teresa DB, Duarte RA, Neto CB, de Oliveira MR, Soares CP. p16INK4A Immunohistochemical Overexpression in Premalignant and Malignant Oral Lesions Infected with Human Papillomavirus. *J Histochem Cytochem* 2003;51:1291-7.
15. Chitapanarux I, Lorvidhaya V, Sittitrai P, Pattarasakulchai T, Tharavichitkul E, Sriuthaisiriwong P, *et al.* Oral cavity cancers at a young age: Analysis of patient, tumor and treatment characteristics in Chiang Mai University Hospital. *Oral Oncol* 2006;42:83–8.
16. Holm LE, Lundquist PG, Silfversward C, Sobin A. Histopathological grading of malignancy in Squamous cell carcinoma of the oral tongue. *Acta Otolaryngol* 1982;94:185-92.
17. Garavello W, Spreafico R, Gaini RM. Oral tongue cancer in young patients: A matched analysis. *Oral Oncol* 2007;43:894–7.
18. Sherin N, Simi T, Shameena PM, Sudha S. Changing trends in oral cancer. *Ind J Cancer* 2008; 45(3):93-96.

Tables & Graph

Table 1: Total OSCC cases from 2014 to 2023 (total number of cases: 1141)

126

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Total no. of OSCC cases	98	89	103	108	121	105	116	124	112	165	1141
OSCC cases in younger age group	11	08	12	15	20	17	18	20	21	28	170

Table 2: Sex distribution of the oral squamous cell carcinoma cases in older patients (age 45 and above) and younger patients (below age 45)

Gender	Males %	Females %
Old Group	65	35
Young Group	90	10

Table 3: Sitewise Distribution of OSCC in the Groups

Site	Buccal Mucosa	Tongue	RMT	Gingiva	FOM	Others
Old Group	37%	21%	11%	20%	6%	5%
Young Group	13%	35%	22%	12%	10%	8%

Graph 1: Relative Proportion of Young patients to Old in the Study Period

