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Demographic trends, affected anatomical sites and clinicopathological analysis for oral squamous cell carcinoma at a tertiary care hospital in Tuticorin, Tamilnadu: An institutionalized retrospective study

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***Abstract*---**Aim: To study the Demographic trends, Affected Anatomical sites and histopathological analysis of Oral Squamous Cell Carcinoma at a tertiary care Hospital. Methods: The retrospective study was conducted on 100 patients with OSCC, over a period of 6 years form 2014 – 2020. The data collected from the patient includes age, gender, occupation, habits and other risk factors, anatomic site and grade of the tumour. The obtained specimens were graded as well differentiated, moderately differentiated and poorly differentiated as per WHO criteria. The collected data were subjected to statistical analysis and the results were formulated. Results: A total of 100 histopathologically verified cases of OSCC were included in this study. Majority of the OSCC patients were within 40 – 60 year age group (48%), followed by > 60 years age group (31%), while 12% of the patients were within 31- 45 years and 9% were below 30 years. Out of the 100 cases, 55% were male and 45% were female, with a male to female ratio of 1.2:1. Conclusion: The results of the present study conclude that, OSCC is most commonly associated with middle age groups, predominantly male. The recent trends in oral cancer warrants continued investigation through larger demographic studies to create a general awareness.

***Keywords*---**oral squamous cell carcinoma, risk factors, affected sites, grade tumour.

Introduction

Cancer is a debilitating disease with high mortality and morbidity rate, which is considered as a major burden to the public health globally. India ranks third among nations in terms of higher number of cancer cases. The National Cancer Registry Programme (NCRP) had been implemented in India in the year 1981 by National Centre for Disease Informatics and Research (NCDIR). NCRP utilizes a network of population-based cancer registries (PBCRs) and hospital- based cancer registries (HBCRs) to collect data on cancer. According to NCRP report over 13 lakh people in India suffer from cancer every year. The Indian Council of Medical Research (ICMR) estimates India's cancer burden to rise to 29.8 million in 2025 from 26.7 million in 2021. Seven cancers accounted for more than 40% of the total disease burden: lung (10.6%), breast (10.5%), Oesophagus(5.8%), mouth(5.7%),stomach(5.2%), liver(4,6%) and cervix uteri(4.3%).[1]

According to NCRP cancer fact sheets for Tamilnadu, which presents the epidemiological profile and pattern of cancer, the projected incidence of cancer cases for 2020 was 35,863 in males and 42,778 in females. Oral cavity remains

the second most common site in males and fourth most common site in females out of the five leading sites of cancer among the patients in Tamilnadu. Oral cancer is a group of neoplasm affecting any region of the oral cavity, pharyngeal regions and salivary glands. However, this term is often used interchangeably with oral squamous cell carcinoma (OSCC), which constitutes around 90% of all oral cancers.[3] The global variation in the incidence of OSCC has been linked to various socio-cultural characteristics, major geographic differences in risk factors, differences in data collection and the level of development of health services in various populations.[4] The higher incidence of oral cancer in South-East Asia, especially in developing countries like India is largely attributed to the deleterious habits such as tobacco chewing, betel-quid chewing, tobacco smoking, reverse smoking, as well as other factors such as alcohol consumption, low socio-economic status, poor hygiene, poor diet and viral infections, chronic irritation from ill-fitting dentures, rough or fractured tooth.[5] Currently, with therapeutic breakthroughs, cancer now fits into a new category of manageable chronic diseases, which is largely achieved through modification in lifestyle, timely diagnosis and proper management. [6] But regardless of being in anatomic sites easily accessible for clinical examination and inspite of recent diagnostic and therapeutic advances, OSCC's still remains to be a condition with poor prognosis, as the disease is often diagnosed at an advanced stage. Most frequent reasons are the early wrong diagnosis and the ignorance from the patient and/or attending physician or dentist. [7] This justifies the need for further demographic studies exploring the trends of the disease among the local community, which might help in devising strategies for prevention and treatment.

Though there are several published data on the incidence and patterns of oral cancer on different parts of India, it is unfortunate that there is limited literature on the same in the state of Tamilnadu, especially in the district of Thoothukudi, where we observe an increasing incidence of cancer among the general population over the past few years. Hence the purpose of this institutionalized retrospective study is to analyze the trends of oral squamous cell carcinoma in the district of Thoothukudi, with emphasis on age, gender, economic status, occupation, risk factors, geographic distribution, anatomic site and grade of OSCC during the study period of 6 years from 2014 to 2020.

Materials and Methods

The retrospective study was conducted on 100 patients with OSCC, who reported to the Department of dental surgery, Thoothukudi Government medical college and Hospital, over a period of 6 years, from 2014-2020. All the clinically diagnosed cases of OSCC were confirmed histopathologically and included in the study. The data pertaining to the patient collected for the study included age, gender, occupation, habits and other risk factors, anatomic site and grade of the tumor. The specimens were assessed by an expert histopathologist and graded as well differentiated, moderately differentiated and poorly differentiated as per the WHO criteria for histological typing of oral and oropharyngeal tumors [8]. The collected data were subjected to statistical analysis and the results were formulated. Univariate and Bivariate analysis were done using SPSS version 16. P-value <0.05 was considered significant.

Results

A total of 100 histopathologically verified cases of OSCC were included in this study. Table 1 shows the demographic profile and the risk factors of the study group. Majority of the OSCC patients were within 46-60 years age group (48%), followed by >60 years age group (31%), while 12% of the patients were within 31-45 years and 9% were below 30 years. Out of the 100 cases, 55% were male and 45% were female, with a male to female ratio of 1.2:1. Among the patients, 7% were without any risk factors, while 93% revealed exposure to different risk factors. Out of which, 52% cases were attributed to betel nut chewing, 24% to smoking and alcoholism and 17% to sharp tooth. The occupation of the study group was recorded. 54% of the patients were working as daily wager, 17% as farmer/Mason/Welder, 20% as fisherman/saltpan worker, while 9% of the patients were indulged in other occupations. The anatomic site with most frequent occurrence of OSCC was buccal mucosa (44%), followed by tongue (26%), alveolus (14%), floor of the mouth (6%) and others (10%).

The histopathological grading of the presented cases based on differentiation state reveals that, 58% of patients had well differentiated OSCC, while 30% of the cases were moderately differentiated and 12% were poorly differentiated. Table 2 shows the association between various factors such as age, sex, occupation and the risk factors. A statistically significant association has been observed between male gender and the risk factors with a p-value of 0.001. A similar association exists between dailywagers and the various risk factors, which is also statistically significant with a p-value of 0.007.

Table 1. Demographic profile

S.NO	CHARACTERISTICS	FREQUENCY
1.	AGE	
	<30 years	9
	31-45 years	12
	46-60 years	48
	>60 years	31
2.	SEX	
	MALE	55
	FEMALE	45
3.	OCCUPATION	
	DAILYWAGER	54
	FARMER/MASON/WELDER	17
	FISHERMAN/SALTPAN WORKER	20
	OTHERS	9
4.	RISK HABITS	
	BETEL NUT CHEWING	52
	SMOKING/ALCOHOL	24

	SHARP TOOTH	17
	NIL	7

Site of lesion

BUCCAL MUCOSA	44%
TONGUE	26%
ALVEOLUS	14%
FLOOR OF THE MOUTH	6%
OTHERS	10%

Grade of cancer during presentation

WELL-DIFFERENTIATED	58%
MODERATELY DIFFERENTIATED	30%
POORLY DIFFERENTIATED	12%

Table -2
Association between various factors and risk habits

S.NO	CHARACTERISTICS	BETEL NUT	SHARP TOOTH	SMOKING/ ALCOHOL	NIL	P-VALUE
1.	AGE					
	<30 YEARS	5(55.6%)	1(11.1%)	2(22.2%)	1(11.1%)	0.470
	31-45 YEARS	8(66.6%)	2(16.7%)	2(16.7%)	0	
	46-60 YEARS	20(41.7%)	7(14.6%)	17(35.4%)	4(8.3%)	
	>60 YEARS	19(61.3%)	7(22.6%)	3(9.7%)	2(6.5%)	
2.	SEX					
	MALE	28(50.9%)	2(3.6%)	24(43.6%)	1(1.8%)	0.001
	FEMALE	24(53.3%)	15(33.3%)	0	6(13.3%)	
3.	OCCUPATION					
	DAILYWAGER	37(68.5%)	8(14.8%)	7(13%)	2(3.7%)	0.007
	FARMER/MASON/WELDER	6(35.3%)	3(17.6%)	8(47.1%)	0	
	SALTPAN WORKER/FISHERMAN	6(30%)	3(15%)	6(30%)	5(25%)	
	OTHERS	3(33.3%)	3(33.3%)	3(33.3%)	0	

Discussion

The incidence of oral cancer differs in different regions of the world which is largely due to ethnic variations as well as variations in risk factors. In India, an annual incidence of 80,000 new cancer cases is estimated based on the cancer registry data. This could be a major crisis in absence of adequate health care infrastructure. Cancer in general and oral cancer in particular can be considered a lifestyle disease, as it is most frequently observed in association with risk factors such as tobacco chewing, smoking or alcohol consumption. Therefore, the incidence of oral cancer can be reduced by focusing on primary prevention and by risk factor modification. Hence, this study is formulated with the aim of identifying the OSCC susceptible group in terms of age, gender, occupation and socio-economic status as well as the various risk factors and anatomic predilections.

In the present study, most of the patients with OSCC presented within the age group of 46- 60 years (48%) and > 60 years (31%). This is consistent with the study by MP Singh et al, in which most of the patients were in the 4th and 5th decades of life at the time of diagnosis. [9] The results also correlates with the study by Rahman et al who reports that the most affected age group was 51 - 60 years. [10] It is observed that India has a lower mean age of cancer presentation

when compared to western population. This is probably related to cultural practices like betel-quid chewing as well as early initiation of tobacco use due to its easy availability, low cost and socio-cultural acceptance. [11] Males are affected more when compared to females, with a male to female ratio of 1.2: 1. This data corroborate with the findings in other similar studies and may be attributable to the heavier indulgence in risk habits by men. [12, 13] Cancer has been observed high in socio-economically disadvantaged group of the population which could be mainly due to lack of awareness and higher exposure to risk factors. In our study, data shows that most of the patients were daily wagers (54%), followed by fisherman and saltpan workers (20%).

70% of the patients had habits like betel nut chewing, smoking or alcohol consumption. Betel nut chewing remains the most commonly associated risk factor in both males and females (50.9% &53.3% respectively). These are similar to the findings of other similar studies, which shows a higher incidence of OSCC in patients with the habit of using smokeless forms of tobacco. [9] 7% of the cases reported with unidentified risk factors, which warrants further investigation. In our study, buccal mucosa (44%) is found to be the most common site of OSCC occurrence followed by tongue(26%) and alveolar ridge(14%).In India,50% of oral cancers have been reported in the buccal mucosal region, which could be the result of placing the tobacco quid in the gingivosulcus region, whereas in western countries tongue and floor of the mouth are the most affected sites, since the major form of tobacco consumption is in the form of smoking.[13] Present study shows that most of the patients presented with well differentiated OSCC (58%), followed by moderately differentiated(30%) and poorly differentiated OSCC (12%) at the time of diagnosis. This is consistent with the findings of the study by Jamshed et al who also stated that well differentiated SCC was predominantly observed in OSCC affected patients. [7, 14] A similar observation is also noted in the study by Rahman SS et al, who reports that majority of the patients had well differentiated carcinoma (70.73%). [10] In contrary, studies by Minhas et al [7],as well as Abdulla et al [13] reports most patients with moderately differentiated OSCC followed by well differentiated OSCC. The delay in diagnosis is largely due to lack of awareness among the patients, who resort to home remedies before seeking professional help.

Conclusion

The results of the present study conclude that, OSCC is most commonly associated with middle age groups, predominantly male. Majority of the patients were underprivileged with little access to healthcare. Betel quid chewing, which is a common practice in South India, is the most frequent etiological factor among both men and women. Buccal mucosa and tongue remains the anatomic sites with higher occurrence of OSCC. Most of the cases presented were

well differentiated followed by moderately differentiated OSCC. This study is based on the cases that were reported to our tertiary health center and the patient population mainly hails from the southern parts of the state. Hence we do not intend to extrapolate the findings to the general population. The recent trends in oral cancer warrants continued investigation through larger demographic studies to create a general awareness. Understanding the varied presentations and patterns of OSCC would help tremendously in early detection of the condition by the attending physician, and in devising new strategies for prevention and treatment, thereby aiding in reducing the mortality and morbidity associated with oral cancers.

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