Assessment of epidemiology of oral malignancies - An institution based Retrospective study

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ABSTRACT

Oral malignancies are a group of dangerous disease affecting the oral cavity. The subtypes of oral malignancies have distinctive aetiology, epidemiology and multi-year endurance rate. This retrospective study included subjects who reported to the Department of Oral Pathology and Microbiology in Saveetha Dental College from July 2019 - March 2020. Data on age, gender, lesion site, habit profile and diagnosis were recorded and analysed for Pearson's chi-square correlation test between demographic data and oral malignancies. A total of 83 cases were included in the study in which 80 (96.3%) are carcinomas, and 3 (3.75%) are other malignancies. The correlation between the oral malignancy diagnosis and demographic data - age, gender, site and habit showed statistically insignificant (p>0.05) results with p-value = 0.802, 0.898, 0.07and 0.817 respectively. Our study demonstrated that predominance of oral malignancies was seen in the fifth - the seventh decade of life with more propensity towards the male population, and buccal mucosa was identified as the most common site. This study reflects the need to create awareness among the general population regarding the burden of disease and the possibility of preventing it.

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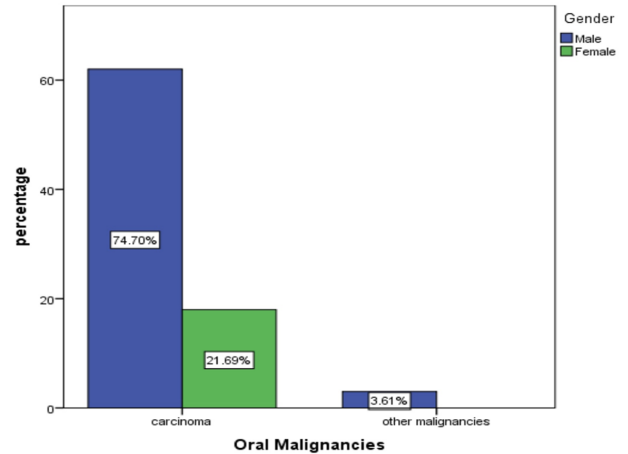## INTRODUCTION

The term malignancy denotes the disease where abnormal cells divide without control. These cells have the potency to invade the nearby tissues and also cause distant metastasis with irrevocable growth potential. Metastasis can occur through lymph or blood to various parts of the body.

Oral cavity encounters several types of malignancies which include carcinoma, sarcoma, lymphoma, leukaemia, etc. Malignancy of epithelial in origin is termed as carcinoma. Worldwide, oral cancer accounts for 2% - 4% of all malignancies with the maximum burden of the disease seen among the south-east Asian population (Ghafari *et al.*, 2006). Oral squamous cell carcinoma (OSCC) is the sixth most common malignancy globally (Sridharan *et al.*, 2017; Sridharan, 2019; Jayaraj *et al.*, 2015b). Oral cancer has consistently been a challenge to overcome, especially in developing countries (Jayaraj *et al.*, 2015a; Gupta and Ramani, 2016). In the majority of the cases, oral cancer was found to be preceded by oral potentially malignant disorders (OPMDs) which undergo malignant transformation (Shree, 2019; Swathy *et al.*, 2015; Jayaraj *et al.*, 2015a). Sarcoma, on the other hand, are malignancies that arise from the connective tissue.
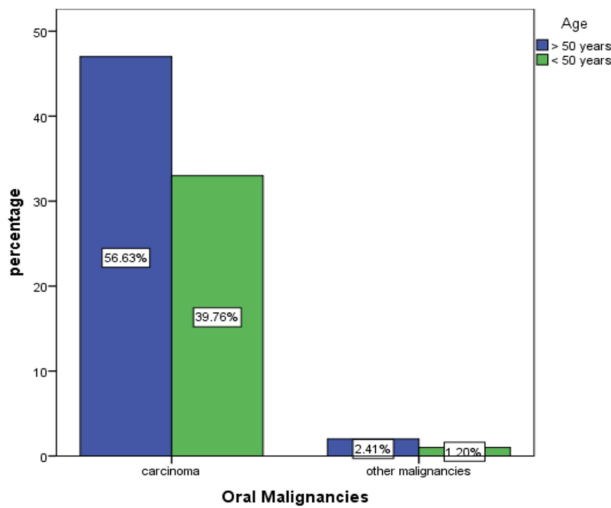
The global prevalence of sarcoma is 3% which esti-
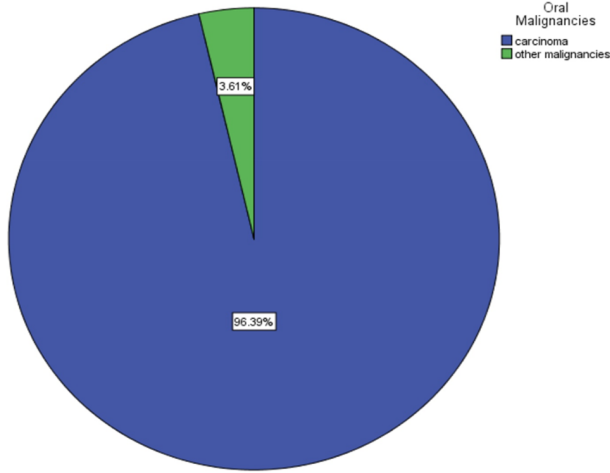
Graph 1: Pie chart showing the prevalence of oral malignancies (carcinoma & other malignancies) at an institutional level. The prevalence of carcinoma is 96.39% (blue) and other oral malignancies is 3.61% (green)
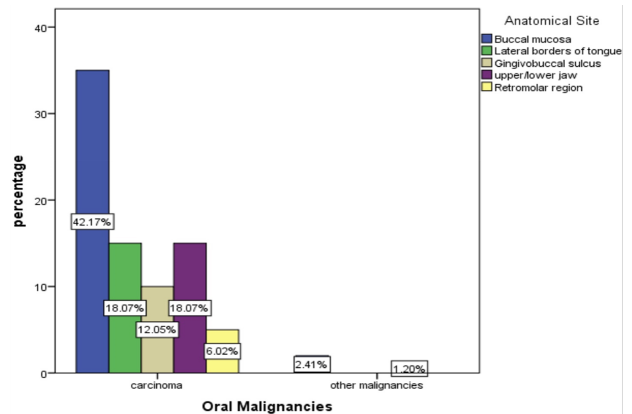

Graph 2: Barchart depicting the correlation of oral malignancies (carcinoma & other malignancies) with age

mates a mortality rate of 128,000 deaths annually. On the whole, the incidence rate of oral malignancies in India is about 20:100,000 people per year (Coelho, 2012; Sivaramakrishnan and Ramani, 2015; Kumar, 2015; Sridharan *et al.*, 2017).

Graph 2 The X axis denotes the oral malignancies and the Y axis denotes the percentage of the cases. 56.63% of patients with carcinoma were >50 years of age and 39.76% were <50 years of age. 2.41% of patients with other malignancies were >50 years of age and 1.20% were <50 years of age. There is no significant association between age and the oral malignancies(p value = 0.070 - not significant).
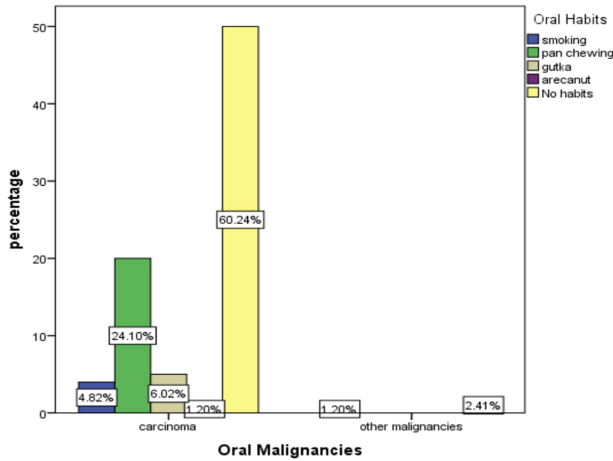

Graph 3: Bar chart depicting the correlation of oral malignancies (carcinoma & other malignancies) with gender

Graph 3 The X axis denotes the oral malignancies and Y axis denotes the percentage of cases. Of the carcinoma patients 74.70% are males and 21.69 % are females. All the 3 patients in other malignancies were males. There is no significant association between gender and the oral malignancies(p value=0.898 - not significant).

Graph 4: Bar chart depicting the correlation of oral malignancies (carcinoma & other malignancies) with anatomical site

Graph 4 X axis denotes the oral malignancies and Y axis denotes the percentage of cases. The anatomical site of carcinoma patients are 42.17% buccal mucosa,18.07% are lateral border of tongue,12.05% are gingivobuccal sulcus, 18.07% are upper/lower jaw & 6.02% are retro molar region and in other malignancies 2.41% were in buccal mucosa & 1.20% were in upper/lower jaw. There is no significant association between site and the oral malignancies(p value=0.817 - not significant).

Graph 5 X axis denotes the oral malignancies and

Graph 5: Bar chart depicting the correlation of oral malignancies (carcinoma & other malignancies) with oral habits

Y axis denotes the percentage of cases. The carcinoma patients habit profile shows 4.82% had smoking, 24.10% had pan chewing, 6.02% had gutka habits & 60.24% did not have habits. The other oral malignancies patient's habit profile shows 1.20% had smoking & 2.41% had no habits. There is no significance between habits and the oral malignancies(p value=0.070 - not significant).
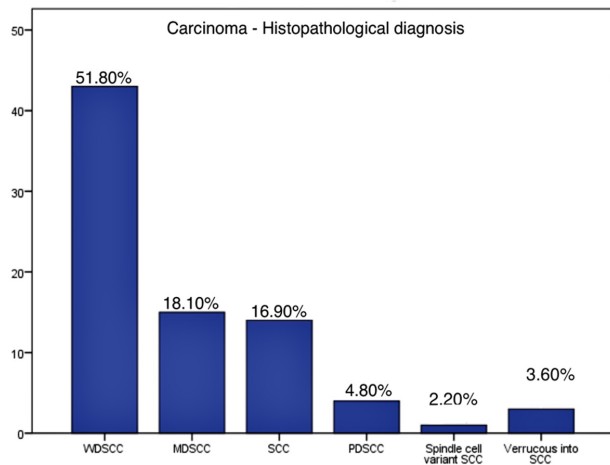
Graph 6: Bar graph depicting the histopathological diagnosis among the carcinoma population

Graph 6 The X axis denotes the oral malignancies and Y axis denotes the percentage of histological diagnosis.The confirmatory histopathological diagnosis shows 51.80% of WDSCC, 18.10% of MDSCC, 16.90% of SCC, 4.80% of PDSCC, 2.20% of spindle cell variant of SCC &3.60% of verrucous into SCC.

Epidemiology is the study and analysis of the distribution, patterns and determinant of health and disease conditions in defined populations (WHO). The study of disease transmission provides a solid estab-lishment for the planning and execution of both communities based and individual oral cavity malignancy control strategies (Conway *et al.*, 2018). Epidemiology also estimates individuals' chances and risk of disease. Studies have revealed the absence of knowledge about oral malignancies and its severity. Hence, early detection and prompt diagnosis can lead to better prognosis and help in the implementation of successful clinical treatment (Sridharan *et al.*, 2017). Furthermore, the assessment of epidemiology renders the need for public education, primarily focusing the high-risk groups.

There are also few similar kinds of research done who have assessed the epidemiology of oral malignancies, Avrahau Zini, et al. in 2010 found OSCC is more common in men below 55 years of age (Zini *et al.*, 2009). They also stated that lymphomas and sarcomas are more common above 20 years of age. Melanomas and metastatic diseases have the lowest survival rate because of their invasion or infiltration and are highly prevalent in the lip (Zini *et al.*, 2009). (Ganesh *et al.*, 2013) assessed the variations in the prevalence of oral malignancy in literacy and occupation levels (Ganesh *et al.*, 2013). No other study has been done to estimate the epidemiology of all oral malignancies at an institutional level. This present study aims at assessing the epidemiology of the oral malignancies at an institutional level.

MATERIALS AND METHODS

This is a retrospective study done with histopathologically confirmed cases of carcinomas and sarcomas in the department of Oral Pathology and Microbiology at Saveetha Dental College and hospitals during July 2019 - March 2020. The study was performed after getting approval from the scientific review board of saveetha dental college and hospitals.

Data was collected from the department archives. The demographic details such as age, gender, habit profile, lesion site and diagnosis of patients with carcinoma and sarcoma were retrieved and tabulated. The age of the patients categorised accordingly between 32-71 years of age. The habit profile was further classified based on the form of tobacco, and this included smokeless tobacco, smoking tobacco and also those having multiple habits were categorised. The site of the lesion was recorded. The collected data are histopathologically confirmed cases of oral malignancies which were cross verified with photographs.

All the collected data were entered in Excel 2013 and statistically analysed using SPSS software version 20.0, IBM. The frequency tables and chi-square

test were performed for all parameters to identify the correlation between the demographic data with its diagnosis. A p-value less than or equal to 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

This study included 83 patients of histopathologically confirmed cases of oral malignancies with 80 cases of carcinoma & 3 examples of other malignancies (Graph 1). The age of the patients ranged from 32-71 years with a mean age of 39. 35 years and a median of 52 years. Among 80 carcinoma patients, 56.63% were >50 years of age, and 39.76% were <50 years of age. Among the three other malignancies, 2.41% were >50 years of age, and 1.20% were <50 years of age. The age distribution of patients is further depicted in (Graph 2).

The gender of the 83 patients was analysed. Among 80 carcinoma patients, 74.70% were male, and 21.69% were female. Among the three other malignancies, 100% of the affected population were male (Graph 3).On evaluating the site of the lesion, 42.17% involved the buccal mucosa, 16.07% the lateral border of the tongue, 18.07% the lower / upper jaw, 12.05% in the gingivobuccal sulcus & 6.02% in the retromolar region. Of the other malignancies 1 case was seen in the buccal mucosa and the other 2 in the jaw. The size distribution, along with the frequencies, is shown in (Graph 4).

The habit profile of 83 patients was categorised based on the different forms of tobacco. Of 83 cases, 60.24% had no habits, 24.01% of cases have a pan chewing habit, 6.02% with gutkha habit, smoking tobacco in 4.62% of cases, 1.2% of cases have betel nut chewing habit (Graph 5). Among the other malignancies,1.20% had a habit of smoking, whereas 2.41% did not have any associated habits. The confirmatory histopathological diagnosis of the oral malignancies among 83 patients,80 cases were carcinoma, and 3 cases were other malignancies, among the OSCC 51.80% was WDSCC, 18.10% was MDSCC, 16.90% SCC, 4.80% PDSCC, 2.20% spindle cell variant of SCC & 3.60% verrucous into SCC (Graph 6). Among the three other malignancies, 1 case was intraepithelial intraosseous malignancy, 1 case was aggressive malignancy, and 1 case was pleomorphic leiomyosarcoma.

The comparison between the demographic data of patients with oral malignancy diagnosis did not show any statistical significance(p-value >0.05). Moreover, the prevalence of oral malignancies did not differ significantly regarding the demographic data of the patients.

The result of our study shows that oral malignancies are most common in the 5th - 7th decade of life. This is following previous literature which reported that oral cancer overall has a higher prevalence in 5th - 7th decade of life (Jemal, 2011; Torre, 2012). Montero et al. also found that the prevalence of carcinoma was predominantly in the 5th decade of life (Montero and Patel, 2015). Prerna Taneja Mathur, et al. who revealed that it is most prevalent in the 5th and 6th decade of life (Mathur *et al.*, 2011). Zachary Burningham et al., Based on current statistics provided by the NCHS and SEER it has been mentioned that the mean age for the incidence of sarcoma is 58 years (Howlader, 1975; Burningham, 2012). Catherine W. Saltus et al. stated that the incidence of sarcoma was predominant between the 5th-7th decade of life, with the majority being in the 7th decade of life (Saltus, 2018). This is because oral habits are more practised as age proceeds due to stress and pressure of responsibilities. Oral habits are the major risk factor for the initialisation and growth of oral malignancies.

Our study shows that the male population is predominantly affected than the female population with the ratio of male: female being 3.6:1 affected with carcinoma and other oral malignances. Weinberg et al. Stated that the most common risk factor for oral cancer is tobacco usage which is more among the male population (Weinberg and Estefan, 2002). Alessandro mennalves et al. found the male population is more affected than the female population (Alves *et al.*, 2018). Catherine.w.saltus also found that males are twice more affected with sarcomas than females (Saltus, 2018). Previous literature stated that age-adjusted incidence is slightly more in male, along with mortality (Pingping *et al.*, 2002). All these previous literature findings are in concordance with the present study stating predominance of the male population in oral malignancies because of increased habit history than females. This is because of the difference in social culture, nutritional state and habits, practised vary remarkably in different parts of the globe and various sectors of the country especially in India and also because of the easy availability of tobacco at a cheaper rate.

But in contrast, a relatively high osteosarcoma incidence rate of 1.4 per 100,000 females was also reported in Sondrio, Italy. These findings may suggest that Japanese migrants living in "westernised" regions may be subject to increase osteosarcoma risk due to environmental or lifestyle factors (Burningham, 2012; Hannah, 2018; Gheena and Ezhilarasan, 2019).

The most frequent site of occurrence in our study

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was buccal mucosa (47%) followed by the lateral border of the tongue and lower jaw (18%). This is probably because the majority of the lesions correspond to the site of maximum exposure to tobacco and other related habits. This is in concordance with Harish Chandra et al. in their analysis found buccal mucosa to be the most common site for oscc (Rai and Ahmed, 2016). (Tandon, 2017) identified 31.47% incidence of oscc is seen in the buccal mucosa (Tandon, 2017). Dhanuthai et al. identified predilection of the involved site with tongue 25.4% & labial/buccal mucosa 21.7% (Dhanuthai et al., 2017). Few previous works of literature state that tongue to be the most frequently affected subsite in oral cancer. This variation may be due to the diversity in morphological characters within different populations or a specific community. Also, they made an analysis, particularly with oral tongue squamous cell carcinoma patients. The anatomical site involved is based on the association & frequency of usage of the tobacco with the site (Jangid, 2015; Thangaraj, 2016; Viveka, 2016). The most common oral malignancy was found to be.

This study result shows that 62.7% of the affected population has no habit of history. This is not in concordance with any previous literature about oral malignancies because of its a proven fact that oral habits are one of the significant risk factors for the incidence of oral malignancies. (Ranganathan et al., 2015; Salian, 2016) analysed and found that frequency of oral malignancy is significantly related to at least one predisposing habit (Ranganathan et al., 2015; Salian, 2016). This discrepancy, in result, may be due to the limited sample size. Also, it depends on the populations' awareness and knowledge towards these habitual oral practices.

Limitations: Data collected from the last eight months (2019-2020) period. So the sample size is minimum. The data collected has geographic restrictions; that is, it involves only a specific population group. This study is institutional-based.

CONCLUSION

The study estimates the epidemiology of the oral malignancies correlating with demographic data of patients. The results of this study show that oral malignancies are more common among the male population in the 5th to 7th decade of life, and buccal mucosa is the predominant site. Thus, the study results reflect the need to create awareness among the general population regarding the burden of disease and the possibility of preventing it. This study was done to initiate an awareness campaign for habit cessation at an institutional level. However, Large scale longitudinal studies are required to substantiate the findings obtained.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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