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Prevalence of Oral Cancer in Patients Reporting to Private Dental Hospital

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ABSTRACT

Background: Oral cancer is one of the 10 most common cancers in the world, with delayed clinical detection, poor prognosis, for the disease, and expensive therapeutic alternatives. Oral cancer is a preventable disease, risk factors and natural history is already being known, where biomedical sciences and dentistry, in particular, are likely to improve their poor clinical indicators.

Objective: The aim of this study is to assess the prevalence of oral cancer among patients visiting Saveetha Dental College.

Methods: A retrospective study was carried out and the case records of patients having oral cancer were collected by reviewing patient records and analyzing the data of 86000 patients from June 2019 to April 2020. Patients diagnosed with oral cancer were selected. The data were collected and subjected to statistical analysis and correlation using SPSS software.

Results: In this study, it was found that 82% of the total patients diagnosed with oral cancer were males and 18% of them were females. It was also found that the commonest site involved was the buccal mucosa (31%). The findings of this study revealed that oral cancer is more prevalent among males and that the commonest site involved is the buccal mucosa.

Conclusion: From this study it is concluded that the prevalence of oral cancer is more among males and according to the site involved, it's more commonly involved in buccal mucosa when compared to other sites.

Key Words: Buccal mucosa, Correlation, Diagnosis, Gender, Oral cancer, Subsite

INTRODUCTION

Oral cancer is a highly relevant problem of global public health, especially for dental surgeons. Oral cancer is malignant neoplasia that arises in the oral cavity and is traditionally defined as a squamous cell carcinoma (OSCC) because in the dental area, 90% of cancers are histologically originated in the squamous cells.¹ The most common etiological factors associated with oral cancer are tobacco accompanied by excessive alcohol use, as well as Human Papillomavirus (HPV) infection²; HPV being mostly associated with oropharyngeal subset.³ Globally, there are geographical variations in oral cancer incidence. The highest rate is reported in Melanesia of the Pacific region, with incidence rates of 22.9% in 100,000 men and 16% per 100,000 for women.⁴ Some countries with the highest incidence rates for oral cancer in the world are located in the region of South Asia.⁵ India has been recognized as the country with the highest incidence of oral cancer in the world, though in some recent reports Sri Lanka and Paki-

stan are ranked in the top.⁶ Oral and pharyngeal carcinomas comprise up to half of all malignancies in India and other Asian countries, with high prevalence being attributed to the influence of carcinogens and region-specific epidemiological factors, especially tobacco and betel quid chewing.⁷ The incidence and mortality rates of oral cancer are particularly higher among men than women.⁸ Most malignant tumors of the oral cavity are squamous cell carcinomas, followed by adenocarcinomas and rarely other types of malignant tumors.⁹ Although it is well known that most oral cancer patients are from older age groups, there is a recent trend of the rising incidence of oral cancer in younger patients, particularly on the tongue.¹⁰ Although drinking and smoking are independent risk factors, they have a synergistic effect and greatly increase risk together.¹¹

In some parts of India, such as the states of Bihar and Maharashtra, smokeless tobacco use is more common than smoking. Apart from regional preferences due to differing

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socio-cultural norms, the preference for smokeless tobacco is inversely related to education and income.¹² Quitting tobacco smoking has been reported to reduce the risk of head and neck cancer in previous studies.¹³ Oral cancer is considered to be a preventable disease that is amenable to early detection and treatment.¹⁴ A conventional oral examination (COE), using normal (incandescent) light, has long been the standard method for oral cancer screening.¹⁵ A careful history taking helps to generate a complete differential diagnosis and all diagnostic possibilities are considered prior to establishment of a definitive diagnosis.¹⁶

Implementation of effective, integrated, and multisectoral preventive strategies targeting multiple risk factors for cancer will reduce in the long-term the incidence of cancer in sites such as oral cavity.¹⁷ Hence, the aim of this study is to assess the prevalence of oral cancer among patients visiting Saveetha Dental College.

MATERIALS AND METHODS

Study Design

This is a retrospective study regarding patients diagnosed with oral cancer who have visited Saveetha Dental College and Hospitals between June 2019- April 2020. The case records of patients with oral cancer were collected by reviewing patient records and analyzing the data of 86000 patients. The final sample size of 51 patients in which sampling bias was minimized with the verification of photos and cross-verification. The study was reviewed by two reviewers and it was cross verified. Ethical committee approval was obtained from the Institutional Ethics Committee (approval number: SDC/SIHEC/2020/DIASDATA/0619-0320).

Inclusion criteria - The patients diagnosed with oral cancer.

Exclusion criteria - An incomplete record in the system.

Data Collection

The data of these patients were collected and tabulated. It included parameters – Patients ID, Age, Gender, jaw involved, and subsite. Age was categorized into 30-40 years, 41-55 years, and patients more than 55 years. Jaws involved were upper, lower, and both arches. After further verification by an external reviewer, it was imported to SPSS software by IBM for statistical analysis. A similar methodology is used for other studies.¹⁸⁻²⁰

Statistical analysis

Percentage, mean, standard deviation, frequency of parameters were employed in the analysis. Chi-square test was used to detect the significance between age, gender, jaw involved and subsite. P-value of less than 0.05 was considered as statistically significant.

RESULTS AND DISCUSSION

In this study, a total of 51 patients were screened. Out of them, about 82% were males and only 18% were females [Figure 1]. Almost 50% of the patients belonged to the 41-55 years age group, whereas 42% of them were more than 55 years and 7% were between 30-40 years [Figure 2]. A maximum number of patients (50%) presented with oral cancer in both arches whereas 44% in the lower arch and only 4% in the upper arch [Figure 3]. 31.1% of the patients were diagnosed with oral cancer involving buccal mucosa, 9% involving retromolar trigone, 3% in the posterior 1/3rd, and lateral border of the tongue [Figure 4].

On performing the Chi-square test, the correlation between age, jaw involved, and subsite revealed no significant correlation ($p > 0.05$) [Figure 5 and 6]; between gender, jaw involved and subsite showed similar results with no significant correlation ($p\text{-value} > 0.05$) [Figure 7 and Table 1]. Correlation between subsite and jaws involved in oral cancer revealed that among the patients with cancer involving both arches, buccal mucosa was the most involved site, although it showed no significance ($p > 0.05$) [Table 2].

Figure 1: Bar graph depicting the prevalence of oral cancer among different gender of patients visiting the dental college. Y-axis represents the frequency of oral cancer patients over a year and X-axis represents the gender of the patients. The graph shows that 82.2% of the patients having oral cancer were males and 17.7% were females. This study showed that oral cancer was more prevalent among males.

Figure 2: Bar graph depicting the prevalence of oral cancer among different age groups of patients visiting the dental college. Y-axis represents the frequency of oral cancer patients over a year and X-axis represents the age of the patients. The graph shows that 51.1% of the patients having oral cancer were between 41-55 years, 42.2% of the patients were more than 55 years old and 6.6% of the patients were 30-40 years. In this study, we observed that the incidence of oral cancer is high in patients with 41-55 yrs age group.

Figure 3: Bar graph depicting the jaws involved in oral cancer among patients visiting the dental college. Y-axis represents the frequency of oral cancer patients over a year and X-axis represents the jaws involved in oral cancer. The graph shows that 51.1% of the patients had oral cancer involving both arches, 44.4% of the patients had in the lower arch and 4.4% of the patients had oral cancer involving the upper arch. In this study, we observed that both arches were commonly involved in oral cancer.

Figure 4: Bar graph depicting the subsite of oral cancer among patients visiting the dental college. Y-axis represents the frequency of oral cancer patients over a year and X-axis represents the subsite of oral cancer. The graph shows that 31.1% of the patients had oral cancer in the buccal mucosa, 8.9% of them had oral cancer in the retromolar trigone and 6.6% of them had in posterior 1/3rd of the tongue. This study revealed that the incidence of oral cancer is more in buccal mucosa and the least involved site is the hard palate

Figure 5: Bar graph depicting the correlation between age and jaws involved in oral cancer. Y-axis represents the jaws involved in oral cancer and X-axis represents the age of the patients. The color blue denotes both arches, green color denotes the upper arch and brown color denotes the lower arch. From the graph, we found that among the patients in the age group 41-55 years, both arches were most commonly involved, and in patients more than 55 years old, the lower arch was more prevalent. But there was no significant association between age and the jaw involved in oral cancer. Chi-square value is $p = 0.478$ ($p > 0.05$ not statistically significant).

Figure 6: Bar graph depicting the correlation between age and subsite involved in oral cancer among the patients visiting a private dental hospital. Y-axis represents the subsite in oral cancer and X-axis represents the age of the patients. From the graph, it was evident that among patients between 41-55 years and those more than 55 years, buccal mucosa was the commonest site whereas, in patients between 30-40 years, retromolar trigone along with buccal mucosa was the commonest site involved. But there was no significant association between age and the subsite in oral cancer. Chi-square value is $p = 0.718$ ($p > 0.05$ not statistically significant).

Figure 7: Bar graph depicting the correlation between gender and subsite involved in oral cancer among patients visiting a private dental hospital. Y-axis represents the subsite in oral cancer and X-axis represents the gender of the patients. From the study, we found that among both males and females, buccal mucosa was more commonly involved when compared to other sites followed by retromolar trigone and posterior 1/3rd of the tongue. But there was no significant association between gender and the subsite involved in oral cancer. Chi-square value $p = 0.655$ ($p > 0.05$ not statistically significant).

Table 1: Table depicting the correlation between gender and jaw involved. From the table, it was evident that there was no significant correlation between gender and the jaw involved in oral cancer. Chi-square value $p = 0.466$ ($p > 0.05$).

Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.529 ^a	2	0.466
Likelihood Ratio	1.186	2	0.553
Linear-by-Linear Association	.034	1	0.854
N of Valid Cases	45		

Table 2: Table depicting the correlation between subsite and jaw involved in oral cancer. From the table, it was evident that there was no significant correlation between the subsite and the jaw involved. Chi-square value $p = 0.291$ ($p > 0.05$).

Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.779 ^a	18	.291
Likelihood Ratio	17.737	18	.473
Linear-by-Linear Association	.240	1	.624
N of Valid Cases	45		

Worldwide there are 350,000–400,000 new cases of oral cancer diagnosed each year. Unlike most other anatomic sites, which have decreased in cancer incidence, the incidence of oral cancer is increasing, particularly among young people and women.²¹

Development of oral or head and neck squamous cell carcinoma (HNSCC) and minor salivary gland carcinomas is influenced by factors namely tobacco, alcohol, viruses, diet and nutrition, radiation, oral thrush, immunosuppression, use of mouthwash, syphilis, dental factors, ethnicity, familial and genetic predisposition, and occupational risks.²² Although information around tobacco exposure as a presiding risk factor for oral and other cancers is now more prevalent, the relationship between alcohol consumption and oral cancer remains uncredited.²³ Oral cancer poses significant mortality and morbidity in the patients, especially when discovered late in the course of the disease.²⁴ Oral squamous cell carcinoma (OSCC) is the most frequent oral malignancy.²⁵ Oral cancer has one of the lowest five-year survival rates among the major types of cancers, including breast, skin, testis, prostate, uterus, and urinary bladder cancers with survival rates of 50% or less.²⁶ The difference in incidence and pattern of oral carcinoma can be attributed to an overall effect of aging of the population as well as some regional differences in the prevalence of certain etiological factors.²⁷ Some of the

recognized risk factors are: tobacco in various forms - smoking as well as smokeless/chewing tobacco; areca nut; heavy consumption of alcohol; infection with human papillomavirus; and presence of oral potentially malignant disorders, all of the above frequently having their effects in a background of diets deficient in antioxidant vitamins and minerals.²⁸ Consumption of areca nut causes other conditions like oral submucous fibrosis.²⁹ Typical signs and symptoms of oral cancer includes white and red patches on the lining of the oral mucosa,³⁰ unhealed oral ulcers, swellings of the mouth, loosening of one or more teeth without obvious reason³¹, jaw pain and stiffness, difficulty or pain in swallowing³², speech difficulties, reduced mobility of the tongue, numbness of the tongue or teeth or lips, bleeding of unknown origin, neck swelling, fetor oris, altered dental occlusion, sore throat, painful tongue and hoarse voice.³³ It is important for dental students to improve their knowledge to enable diagnosis and management of oral cancer and conditions like HIV/AIDS.³⁴

In our study, 82% of the patients were males and 18% of the patients were females. This is supported by a study that shows that 80% of the cases were seen in males whereas only 20% of the cases were seen in females with a male to female ratio of 4:1.³⁵ A high male predominance was noted in patients with cancer of buccal mucosa. According to the findings of this study, most of the patients (31%) had cancer of buccal mucosa. Previous literature revealed that 40.8% of malignancies occurred on the buccal mucosa, 25.6% on the tongue and 5.2% on the lower lip³⁶ whereas another study was done in Thailand revealed that the tongue and palate were the most common site involved.³⁷ Another study showing similar findings revealed that tongue was the commonest site identified in 52% of the patients followed by buccal mucosa in 26% of the patients.³⁸ Our study revealed that 51% of the patients were 41-55 years old, 42% of them were more than 55 years old and only 7% of the patients were 30-40 years old. Similar results were shown by a study which indicated that 74% of the malignant cases are seen in the patients with 40-65 years old³⁹ and majority of the patients (about 55%) presented between the ages of 40–60 years.⁴⁰ Early examinations are more likely to result in early-stage diagnosis, which in turn is linked to reduced mortality and favorable treatment outcomes. The challenge facing health professionals is getting people, particularly people at high risk for oral cancer, to undergo an oral cancer examination.⁴¹ Currently, tissue biopsy remains the gold standard for oral cancer diagnosis, but it is invasive, which may cause patient discomfort. Thus, there is an urgent need for exploring non-invasive, highly sensitive, and specific diagnostic techniques.⁴²

Although our findings did not show any significant relevance, it helps to assess the occurrence of cancer among patients from different ethical and socioeconomic groups. Our study also helps to make Health care providers place greater emphasis on educating patients about the importance of vis-

iting a clinician as soon as oral symptoms develop. Public education efforts must also continue to encourage patients to avoid high-risk behaviors as tobacco or alcohol use. Dental anxiety and fear are common among patients⁴³ but dentists should serve as an aid during the screening of such malignant conditions and the main concern of the dentist for their patients is to minimize the experience of pain⁴⁴ and patient's anxiety is undesirable side effect which affect the willingness of the patient to undergo treatment.⁴⁵

CONCLUSION

It was found from our study that the prevalence of oral cancer was more among the males, who presented with oral cancer involving mostly the buccal mucosa. This study helps to evaluate awareness, knowledge of risk factors, identifying early signs, symptoms of oral cancer, and highlights the need for more structured preventive programs. Histomorphological and molecular parameters at this biological hot spot of tumor—host interface seem to be potential tools to be incorporated into a prognostic system that will better reflect the biologic diversity of oral cancer and more accurately predict clinical outcome and/or response to a particular type of adjuvant therapy. Dentists and health workers should give more emphasis on this by performing oral cancer screening, raising levels of knowledge, and rectifying misconceptions about oral cancer.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported

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