

Prevalence of Oral Cancer and its Associated Risk Factors among Oral Cancer Patients Presenting at HBS Dental and General Hospital, Islamabad

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ABSTRACT

Objective: To determine the prevalence of oral cancer and to find out the various risk factors associated with oral cancer.

Study Design: Descriptive cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Oral Pathology and Oral Medicine, HBS Medical and Dental College Islamabad from November 2018 to September 2021 for a period of 03 years.

Materials and Methods: Five hundred and forty-three patients diagnosed with oral cancer were enrolled. Daily and monthly outpatient statistics was also recorded for the study period.

Results: The mean age was 54.58 ± 0.50 years. Among patients with different types of habits, 323 (73.2%) patients were tobacco chewers, there were 60 (13.6%) smokers, 32 (7.3%) pan chewers without tobacco, 17 (3.9%) smokers and tobacco-chewers, 2 (0.5%) alcoholics and 7 (1.5%) patients had multiple habits (alcohol use along with smoking and or tobacco chewing). In total, maximum number of patients belonged to carcinoma of buccal mucosa 219 (40.4%) followed by cancer of tongue 96 (17.7%), carcinoma of gingivo-buccal sulcus 49 (9%), carcinoma of alveolar ridge or gingival 41 (7.5%), carcinoma of retromolar area 33 (6.1%), carcinoma of palate 31 (5.7%), carcinoma of floor of mouth 21 (3.8%) and carcinoma of lip 21 (3.8%). On the whole, maximum number of patients belonged to stage IV oral cancer in 249 (45.9%) followed by stage III in 182 (33.5%), stage II in 92 (16.9%) and stage I oral cancer in 20 (3.7%).

Conclusion: This study gives different grades of oral squamous cell carcinomas well as frequency and site of involvement. Oral cancer developed at a younger age with higher prevalence of female. It has been observed that the risk factors like habits and oral cancer have significant associations.

Key Words: Oral cancer, Risk factors, Tobacco, Prevalence, Prevention

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INTRODUCTION

In oral cancer, the tongue, buccal mucosa, lips and remaining part of the oral cavity are included however, the major salivary glands are not included. Till now oral cancer is remained as a fatal disease, also the most disfiguring and devastating among all malignancies. Globally, it is considered for higher rate of mortality and morbidity particularly in countries which are

under developed.^{1,2} Every year almost 400,000 expected new cases of oral cancer are diagnosed worldwide, two-third of which are found in countries of continent Asia including Pakistan, Bangladesh, Indonesia, Sri Lanka and India.³ Oral cancer is the frequent malignancy and more than 25% of oral cancer cases are observed in the countries which are at a high risk.⁴ Its prevalence is directly proportional to the age and maximum in age >60 years, although its incidence is also increasing in younger people of 40 year age.⁵ Oral squamous cell carcinoma is very common malignancy consisting of about 90% of all malignancies of oral cavity.⁶ Most of the oropharyngeal cancers are oral squamous in nature comprising 90% to 94% of the oral cancer.⁷ There are different forms of presentation and several clinical features of oral squamous cell carcinoma. After tumor's surgical resection the life quality of the patient suffering from cancer is very poor because of esthetic and functional reasons. If the patient of oral cancer is diagnosed earlier then the patients have chances of good prognosis. The oral pathologist is the

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first one who observe the patients having oral cancer therefore the dentist must be aware of oral cancer.^{8,9} The oral cancer has risk factors including betel quid chewing, use of alcoholic beverages, chronic inflammation and heavy consumption of tobacco. In recent decades incidence of oropharyngeal cancer and HPV-associated oral cancer has been increased mostly found in younger people.^{10,11}

As the prevalence of oral cancer changes by anatomical site, age, treatment and geographical site. So, from each geographical site collection of descriptive data of oral cancer is important to assess the problem. The objective of this study was to determine the prevalence of oral cancer and its associated risk factors among oral cancer patients.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted at Department of Oral Pathology and Oral Medicine of HBS Medical and Dental College Islamabad from 1st November 2018 to 1st September 2021. Ethical committee approval was obtained from the Institutional Ethics Committee. A total of 543 patients diagnosed with oral cancer were included in this study as per inclusion criteria. Patients with other oral malignancies and oral pathologies were excluded from the study. Information was also collected concerning the personal habits like smoking, use of various forms of smokeless tobacco and alcohol. Data about the duration of onset of symptoms, family history was also recorded. Regarding family history, only history of cancer in the patients' family with respect to patients' parents or siblings was recorded. It was recorded as present or absent.

The anatomic site of cancer, type, its histologic differentiation, regional lymph node involvement and its staging were also recorded. Squamous cell carcinoma cases on the basis of histologically divided in 3 grades: Grade I include well differentiated, Grade II moderately differentiated & Grade III poorly differentiated as per criteria of WHO. The clinical staging of the tumor was corded was mentioned. The staging based on TNM grades was broadly divided into Stage I (TIN o), Stage II (T-No), Stage III (TIN_{1,2}) and Stage IV (T4N_{1,2,3} or M₁). Data was entered and analyzed using SPSS-20.

RESULTS

Most of the patients 148 (27.2%) were in the 60-69 year group, followed by those belonging to the age group 40-49 years 140 (25.8%) and 50-59 years 137 (25.2%), 70-79 years 58 (10.7%), 30-39 years 38 (7%), 80 years or more 12 (2.2%) and less than 29 years age group 10 (1.9%). The mean age of the patients was 54.58±0.50 years with an age range of 22 to 93 years. There were 334 (61.5%) females and 209 (38.5%) males. Among the total patients (543), there were 441 (80.2%) with habits and 102 (19.8%) free from habits and the

difference was statistically significant ($p < 0.0001$). Among patients with different types of habits (441), 323 (73.2%) patients were tobacco chewers, there were 60 (13.6%) smokers, 32 (7.3%) pan chewers without tobacco, 17 (3.9%) smokers and tobacco-chewers, 02 (0.5%) alcoholics and 07 (1.5%) patients had multiple habits (alcohol use along with smoking and or tobacco chewing). Proportion of patients with history of smokeless tobacco use-323 (73.2%) were significantly higher ($p < 0.001$) compared to those with other types of habits (Tables 1-2).

Among patients with habits (441), majority of patients 184 (41.5%) had practiced the habits for a period of 20-29 years followed by 10-19 year duration group 132 (30%), less than 10 year duration group 71 (16.1%), 30-39 year duration group 48 (11%) and more than 39 year duration group 6 (1.4%). The mean duration of habit was 23.25 years (Table 3).

Table No. 1: Comparison of gender according to age

Age (years)	Gender		Total
	Male	Female	
≤29	6 (60%)	4 (40%)	10 (1.9%)
30-39	17 (44.7%)	21 (55.3%)	38 (7%)
40-49	56 (40%)	84 (60%)	140 (25.8%)
50-59	55 (40.1%)	82 (59.9%)	137 (25.2%)
60-69	55 (37.2%)	93 (62.8%)	148 (27.2%)
70-79	19 (32.8%)	39 (67.2%)	58 (10.7%)
80+	1 (8.3%)	11 (91.7%)	12 (2.2%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.2: Comparison of gender according to marital status

Marital status	Gender		Total
	Male	Female	
Married	204 (38.1%)	331 (61.9%)	535 (98.5%)
Unmarried	5 (62.5%)	3 (37.5%)	8 (1.5%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.3: Comparison of gender according habits

Habits	Gender		Total
	Male	Female	
With habits	170 (38.5%)	271 (61.5%)	441 (80.2%)
Free from habits	39 (38.2%)	63 (61.8%)	102 (19.8%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

All the histologically confirmed oral cancer patients belonged to squamous cell carcinoma type. In total, maximum number of patients belonged to carcinoma of buccal mucosa 219 (40.4%) followed by cancer of tongue 96 (17.7%), carcinoma of gingivo-buccal sulcus 49 (9%), carcinoma of alveolar ridge or gingival 41 (7.5%), carcinoma of retromolar area 33 (6.1%), carcinoma of palate 31 (5.7%), carcinoma of floor of mouth 21 (3.8%) and carcinoma of lip 21 (3.8%). There were 32 (5.9%) patients with oral cancer involving

multiple sites. Majority of the patients had well differentiated squamous cell carcinoma 272 (50.6%) followed by moderately differentiated 144 (26.5%) and poorly differentiated squamous cell carcinoma 124 (22.9%).

Table No.4: Distribution of patients consistent with types of habits according to gender

Habits	Gender		Total
	Male	Female	
Smoking	60 (100%)	-	60 (13.6%)
Pan chewing without tobacco	5 (15.6%)	27 (84.4%)	32 (7.3%)
Smokeless tobacco	79 (24.5%)	244 (75.5%)	323 (73.2%)
Smoking & tobacco chewing	17 (100%)	-	17 (3.9%)
Alcohol use	2 (100%)	-	2 (0.5%)
Multiple habits	7 (100%)	-	7 (1.5%)
Total	170 (38.5%)	271 (61.5%)	441 (100%)

Table No.5: Distribution of patients according to duration of reporting first signs of oral cancer among gender

Duration	Gender		Total
	Male	Female	
<15 days	1 (50%)	1 (50%)	2 (0.4%)
15 days-1 month	47 (33.3%)	94 (66.7%)	141 (26%)
1-3 months	96 (38.1%)	156 (61.9%)	252 (46.4%)
4-6 months	41 (42.7%)	55 (57.3%)	96 (17.7%)
7 months-1 year	16 (42.1%)	22 (57.9%)	38 (7%)
>1 year	8 (57.1%)	6 (42.9%)	14 (2.5%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.6: Distribution of patients according to site of carcinoma and sex

Site of carcinoma	Gender		Total
	Male	Female	
Buccal mucosa	59 (26.9%)	160 (73.1%)	219 (40.4%)
Tongue	63 (65.6%)	33 (34.4%)	96 (17.7%)
Gingivo-Buccal sulcus	14 (28.6%)	35 (71.4%)	49 (9%)
Alveolar ridge/Gingiva	11 (26.8%)	30 (73.2%)	41 (7.5%)
Retromolar area	10 (30.3%)	23 (69.7%)	33 (6.1%)
Palate	21 (67.7%)	10 (32.3%)	31 (5.7%)
Floor of mouth	17 (81%)	4 (19%)	21 (3.8%)
Lip	4 (19%)	17 (81%)	21 (3.8%)
Multiple sites	10 (31.4%)	22 (68.6%)	32 (5.9%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.7: Distribution of patients according to histological differentiation of squamous cell carcinoma

Differentiation	Gender		Total
	Male	Female	
Well	110 (40%)	165 (60%)	275 (50.6%)
Moderate	52 (36.1%)	92 (63.9%)	144 (26.5%)
Poor	47 (37.4%)	77 (62.6%)	124 (22.9%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.8: Distribution of patients according to lymph node metastasis and sex

Metastasis	Gender		Total
	Male	Female	
Present	162 (37.9%)	266 (62.1%)	428 (78.8%)
Absent	47 (30.3%)	68 (69.7%)	155 (21.1%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

Table No.9: Distribution of patients according to staging of oral cancer and sex

Stage of carcinoma	Gender		Total
	Male	Female	
I	11 (55%)	9 (45%)	20 (3.7%)
II	34 (37%)	58 (63%)	92 (16.9%)
III	74 (40.7%)	108 (59.3%)	182 (33.5%)
IV	90 (36.1%)	159 (63.9%)	249 (45.9%)
Total	209 (38.5%)	334 (61.5%)	543 (100%)

On the whole, most of the patients had lymph node metastasis 428 (78.8%) at the time of diagnosis and 155 (21.1%) patients had no lymph node metastasis. Proportion of females was higher compared to males in both the groups. On the whole, maximum number of patients belonged to stage IV oral cancer in 249 (45.9%) followed by stage III in 182 (33.5%), stage II in 92 (16.9%) and stage I oral cancer in 20 (3.7%) [Tables 4-9].

DISCUSSION

There were 61% males and 39% females with mean of 48.52 ± 5.24 years. The distribution of gender is in line with African and Pakistani population, although the male predominance was noted equal to 4:3:1 in larger sample conducted at multicenter.^{12,13} It has been considered worldwide that the prevalence of oral cancer is associated with increasing age. Patients having 40 to 49 years of age have maximum risk of oral cancer.¹² Our study have mean age of 55 years, these finding are comparable with the results of multi-center study conducted in Yemen and Pakistan.^{14,15}

Among the total patients, 80.2% of them had habits and 19.8% of them were habit free and the difference was

statistically significant ($p < 0.0001$). This is in line with the studies by Gupta et al.^{16,17} from India about the upper gastrointestinal tract indicated that the extrapolation of risk of cancer in general population on the basis of total risk score of smoking, chewing tobacco, drinking and habits of other morbid lifestyle has a high level of prognostic validity and power.

In our study patients with habits, 73.2% chewed tobacco, 13.6% were smokers, 3.9% patients with both smoking and tobacco chewing habits and 1.5% with multiple habits indicating that 92.2% of the patients used tobacco in some form. There were 7.3% patients who chewed pan without tobacco. Among these groups of patients, proportion of patients with tobacco chewing habit (smokeless tobacco) were significantly higher ($p < 0.001$) compared to patients with other types of habits. This finding is in line with the annual reports of Muwonge et al¹⁸ and Petti et al.¹⁹ In our study, all the histologically confirmed oral cancer patients included in the study belonged to squamous cell carcinoma type. On the whole, maximum number of patients (40.4%) belonged to carcinoma of buccal mucosa followed by carcinoma of tongue (17.5%), carcinoma of gingivo-buccal sulcus (9%), carcinoma of alveolar ridge (7.5%) and the least common was carcinoma of floor of the mouth (3.8%) and carcinoma of lip (3.8%). There were 5.9% of patients with oral cancer involving multiple sites. In various population and geographical location the site of involvement varies in oral cancer. 50% cases of oral cancer floor of the mouth and the tongue has been observed in patients enrolled from Western societies, but the labial/buccal mucosa, gums, plate were minimally involved.²⁰

Siddiqi et al²¹ reported that relative risk (RR) for mouth cancer (lip, tongue and oral cavity) was 3.43 in users of SLT/chewers. Mostly, tongue is observed the most common site of involvement for oral cancer due to drinking alcohol and smoking in excessive amount.²²

Overall, almost 50.6% patients (grade I) had well differentiated squamous cell carcinoma, (grade II) moderately differentiated 26.5% and (grade III) poorly differentiated squamous cell carcinoma to be 22.9% patients. Son et al²³ reported that mostly patients had grade-I squamous cell carcinoma.

Most of the patients (78.8%) had lymph node metastasis at the time of diagnosis compared to 21.1% patients who had no lymph node metastasis. This is in line with the study of Sankarnarayanan¹ (74% had lymph node metastasis at initial visit) and the same author reported that data from other studies in major hospitals in India show 60%-80% lymph node metastasis and only 10-15% having localised cancers. Quadri et al²⁴ and Hung et al²⁵ in their studies had 54% patients having lymph node metastasis.

CONCLUSION

This study gives different grades of oral squamous cell carcinoma as well as frequency and site of involvement. Oral cancer developed at a younger age with higher

prevalence of female. It has been observed that the risk factors like habits and oral cancer have significant associations. The oral health practitioners should be actively involved in conducting and implementing several strategies of prevention in this cancer prone region.

Author's Contribution:

Concept & Design of Study:	Sobia Siddique
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