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Original Research Article

Retrospective analysis of oral cancers in Shimla-Himachal Pradesh (2011-2018): a hospital-based study

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ABSTRACT

Background: Oral cancer ranks in the top three of all cancers in India, and oral cancer control is quickly becoming a global health priority. To analyse the epidemiological and clinical profile of oral cancer patients treated in Tertiary Care Center, IGMC, Shimla from 2011-2018.
Methods: A retrospective study of patients with oral cancers treated from 2011-2018 at TCC, IGMC, Shimla was conducted. Demographic characteristics, tobacco use and oral cancer characteristics related to site, histology and stage at presentation were recorded from patient file records at TCC, Shimla. Data was analysed by Statistical package for social sciences (SPSS) version 16. Statistical test used was chi square test. A p value of 0.05 was considered to be statistically significant.
Results: Oral cancer represents 1.53% of overall cancers. The total number of subjects were 246 out of which 205 were men and 41 were women thus making a male female ratio of 5:1. Peak age of occurrence is the 5th and 6th decade. The most common site involved was tongue (37.5%) followed by buccal mucosa (35.5%). Buccal mucosa was significantly associated with male gender, age group of less than 40 years. Lip was significantly associated with female gender, more than 60 years and with no habits. Floor of the mouth was significantly associated with males, 40-60 year age group and tobacco smoking.
Conclusions: Strategies to overcome the present situation must be undertaken at state level by oral health programs for the early diagnosis and prevention and to support a tobacco free environment.

Keywords: Oral cancer, Tobacco, Alcohol

INTRODUCTION

Oral cancer is major public health problem in the Indian subcontinent, where it ranks among the top three cancers in the country. In India, 20 per 100000 population are affected by oral cancer which accounts for about 30% of all types of cancer.[1] Over 5 people in India die every hour everyday because of oral cancer.[2] Squamous cell carcinoma (SCC) is the most common malignant neoplasm of the oral cavity and represents about 90% of all oral malignancies.[3] Oral squamous cell carcinoma (OSCC) is an important cause of morbidity and mortality worldwide with an incidence rate that varies widely by geographic location.[4] The principal anatomic zones of OSCC are the tongue, buccal mucosa, floor of the mouth, alveolus, palate, and other sites in the mouth. The anatomic zones or sites affected vary based on geographical areas.[5]

This high incidence rate relates directly to risk behaviours such as smoking, use of smokeless tobacco and alcohol consumption and are thus preventable.[6] This implies that oral cancer is a self-induced disease, which is amenable to primary prevention.

Recent publications have highlighted variations in oral cancer trends by geographical location, anatomic site, race, age and gender.[2,7] Thus, descriptive oral cancer data for each specific geographic area are important for many reasons, including understanding the extent of the problem, determining which groups within the population are at highest and lowest risk, and relating the burden of oral cancer to that of other cancers to evaluate the allocation of resources for research, prevention, treatment and support services.[7,8]

The studies on trends in oral cancer have been reported from various parts of India, but for Himachal Pradesh we found only one study on searching the literature, which was reported twelve years back, thus there was an urgent need to check the spectrum of oral cancers at present in Himachal Pradesh.[9] So the aim of the present study was to evaluate the epidemiological and clinical profile of oral cancer patients treated in Tertiary Care Center (TCC), Indira Gandhi Medical College (TCC), Shimla from 2011-2018.

METHODS

A retrospective study of oral cancer patients was carried out for the years 2011-2018 at Tertiary Care Centre, IGMC, Shimla. Prior permission was taken from the authorities of the TCC, to conduct the study. Data was extracted from the patient file records with the department of Radiation Oncology, TCC, IGMC, Shimla. Variables analyzed for each patient included age, gender, address, history of tobacco and alcohol abuse, history of any cancer in the first degree family members, symptoms at the time of presentation, histology and staging of disease at the time of diagnosis.

Age of the patients was divided into three groups: <40 years, between 40 and 60 years, and >60 years. The anatomical sites reviewed in this study included lip, upper and lower alveolus, buccal mucosa, hard palate, anterior 2/3 of tongue and floor of the mouth. Four habits i,e Tobacco smoking, Tobacco chewing, Alcohol consumption and no habits were considered for analysis. The tumors were histopathologically graded by cell differentiation into well differentiated, moderately differentiated and poorly differentiated categories as per the World Health Organization criteria.[10]

A total of 267 oral cancer patients records were found, but due to lack of complete record for 21 patients, only 246 subjects were considered for the study.

The data was entered in Microsoft excel and analysed with statistical package for social sciences (SPSS) version 16. Statistical test used were chi square test or Fisher exact test. A $p<0.05$ was considered to be statistically significant.

RESULTS

Out of the total 17388 cancer patients registered with TCC, IGMC, Shimla between 2011-2018, there were 267 oral cancer patients i.e. oral cancers represented 1.53% of all cancers.

Table 1: Distribution of subjects according to various variables.

	Males (%)	Females (%)	Total (%)
Gender	205 (83.3)	41 (16.7%)	246 (100)
Age group (in years)			
<40	43 (21)	4 (9.8)	47 (19.2)
40-60	95 (46.3)	23 (56.1)	118 (47.9)
>60	67 (32.7)	14 (34.1)	81 (32.9)
Total	201 (100)	41 (100)	246 (100)
Habits			
Tobacco smoking	145 (94,1)	9 (5.9)	154 (62.6)
Tobacco chewing	58 (95.0)	3 (5)	61 (24.7)
Alcohol consuption	106 (98.1)	2 (1.9)	108 (43.9)
No habits	46 (59.7)	31 (40.3)	77 (31.3)
Site			
Tongue	75 (85.5)	17 (18.5)	92 (37.5)
Buccal mucosa	78 (89.7)	9 (10.3)	87 (35.5)
Lip	13 (61.9)	8 (38.1)	21 (8.5)
Hard Palate	14 (73.7)	5 (26.3)	19 (7.7)
Floor of the mouth	13 (100)	0	13 (5.3)
Alveolus	9 (90)	1 (10)	10 (4.1)
RetromolarTriagone area	3 (75)	1 (25)	4 (1.5)
Total	205 (100)	41 (100)	246 (100)

Continued.

	Males (%)	Females (%)	Total (%)
Symptoms			
Ulceration	111 (86)	18 (14)	129 (52.4)
Swelling	66 (76.7)	20 (13.3)	86 (34.9)
Pain	19 (86.3)	3 (13.7)	22 (8.9)
Difficulty in swallowing	8 (100)	0	8 (3.2)
Change in quality of voice	1 (100)	0	1 (0.4)
Total	205 (100)	41 (100)	246 (100)
Staging			
Stage I	23 (11.2)	6 (14.6)	29 (11.7)
Stage II	71 (34.6)	14 (34.1)	85 (34.6)
Stage III	37 (18)	12 (29.3)	49 (19.9)
Stage IV	74 (36.1)	9 (22.0)	83 (33.8)
Total	205 (100)	41 (100)	246 (100)
Grading			
Well differentiated	78 (86.7)	12 (13.3)	90 (100)
Moderately differentiated	44 (80.0)	11 (20.0)	55 (100)
Poorly differentiated	13 (92.9)	1 (7.1)	14 (100)
Nothing otherwise specified	70 (80.2)	17 (19.8)	87 (100)
Total	205 (100)	41 (100)	206 (100)

There were 205 (83.3%) men as compared to 41 (16.7%) women yielding a male female ratio of 5: 1. (Table 1)

The age of the patients ranged from 25 to 92 years with a mean of 55.19±13.86 years. Most of the patients (47.9%) were in the age group between 40-60 years followed by patients of more than 60 years (32.9%). However, 19.2% of the patients were <40 years old. (Table 1)

Table 2: Association between site and gender.

Site	Prevalence	P value
Tongue	Males	0.59
Buccal Mucosa	Males	0.034*
Lip	Females	0.012*
Hard palate	Females	0.19
Alveolus	Males	0.48
Floor of the mouth	Males	0.08*
Retromolartrigone	Females	0.52

*significant

The maximum number of patients were from the Mandi district (50 patients, 20.3%) followed by Shimla (32 patients and 13.0%) and Kangra (30 patients or 12.1%), followed by Solan (8 or 8.79%). (Table 1)

Our findings showed that 43.9% of the total patients had the habit of alcohol consumption while 62.6% had the habit of tobacco smoking (cig and bidi). Tobacco chewing was found in 24.8% of the patients. In our sample, 31.3% of the patients had no habits. (Table 1).

The most common site for OSCC was tongue (37.5%%), followed by Buccal mucosa (35.5%), lip (8.6%), hard palate (7.3%), floor of the mouth (5.3%), alveolus (4.1%) and retromolartrigone area (1.7%) (Table 1).

Table 3: Association between site and age groups.

Site	Prevalant age group	P value
Tongue	40-60 years	0.400
Buccal mucosa	< 40 years	0.008*
Lip	> 60 years	0.004*
Hard Palate	> 60 years	0.290
Alveolus	> 60 years	0.365
Floor of the mouth	40-60 years	0.003*
Retromolartrigone	40-60 years	0.338

*significant

The association between the various sites of oral cancer and gender of patients is shown in Table 2. Tongue was affected in 41.5% of males as compared to 36.6% of women but the difference was not statistically significant. Association between buccal mucosa site and men was found to be statistically significant (p=0.034). Lip was associated significantly with women (p=0.012). Floor of the mouth was also significantly associated with men (p=0.08)

The association between various tumor sites and different age groups is reported in Table 3. Among the age groups considered, the buccal mucosa as the tumor site was most prevalent in the age group <40 years (p=0.008). Tumor of the lip was most commonly observed in the age group of >60 years, and there is a statistically significant association between them (p=0.004). Floor of the mouth as the tumor site was significantly associated with the age group of ≥40–<60 years (p=0.003).

Table 4: Association between site and habits.

Site	Most Prevalent Habit	P value
Tongue	Tobacco smoking	0.650
Buccal mucosa	Tobacco use plus alcohol consuption	0.467
Lip	No habits	0.030*
Hard Palate	Tobacco smoking	0.234
Alveolus	Tobacco smoking	0.019*
Floor of the mouth	Tobacco smoking	0.042*
Retromolartrigone	Tobacco smoking	0.629

*significant

The association between the various sites and habits of patients is shown in Table 4. Floor of the mouth and alveolus were significantly associated with tobacco smoking (p=0.042 and 0.029). Lip was also found to be significantly associated with no habits group (p=0.012).

The most common symptom at the presentation was ulcerations in 129 (52.4%) followed by swelling in 63 (25.6%).

Almost equal number of subjects were in TNM stage II and stage IV: 85 (34.6%) were in TNM stage II and 83 (33.7%) in stage IV followed by stage III (19.9%). Histopathologically 36.6% were well differentiated carcinomas, 22.4% were moderately differentiated carcinomas, 5.7%were poorly differentiated carcinomas and 35.4% were nothing otherwise specified.

DISCUSSION

Understanding the epidemiology and the risk factors for oral cancers can help early identification and prompt treatment of patients with oral cancers. Early diagnosis of oral cancer is important as it leads to early institution of therapy that translates in a better prognosis. Late detection and diagnosis is directly proportional to increased morbidity and mortality.

In India, the age standardized incidence rate of oral cancer is 12.6 per 100000 population.[11] The variation in the incidence of oral cancers by sub-site is mostly related to the relative distribution consumption of major risk factors such as tobacco or betel quid chewing, cigarette or bidi smoking and alcohol.

In the present study oral cancer represented 1.53% of all cancers which is which is less as compared to 8.87% given by Bhattacharjee well as 14% at RCC Trivandrum by Padmakumary et al.[12,13] The male-to-female ratio of 5:1 in our study was higher than that reported by Mehrotra et al (3.8:1), Tandon et al (3.2:1) and Shenoi et al (3:1) but is comparable to 4.1:1 as reported by Jayasoorya.[14-17] Men are more commonly affected compared to women by OSCC in both developed (men: women ratio 2.5:1) and developing (men: women ratio 3:1) countries, which may be due to easy acceptance of habits by men.[17] However, in recent time, this difference in gender distribution is reducing in the developed countries due to more women taking up tobacco related habits including smoking.

Association between buccal mucosa site and males was found to be statistically significant (p=0.034) which was also reported by Singhania reflecting association of high risk factors like tobacco smoking and alcohol consumption being pre-dominantly a male habit.[18] Association between male gender and tongue as the tumor site was not statistically significant (p=0.59). Lip carcinoma was significantly associated with females in our study which could be possibly due to long outdoor activities of farming among them, as most of them are from rural background. Floor of the mouth was also significantly associated with male gender (p=0.08).

In our study, youngest of all patients affected was 25-years old and the oldest was 92 years. Most of the patients were in the 5th and 6th decade (40-60yrs) which is consistent with Singh, Sharma, Krishna, Kiran et al and Saraswati et al, Sankaranarayan et al found that the peak-age of occurrence which is fifth decade in India is at least a decade earlier than that described in the western literature.[19-24] Gupta et al observed an increase in the incidence of oral cancer in the younger (less than 50 years) age group.[25] Epidemiological study of oral cancer in India by Chattopadhyay et al and Mathew et al reported that in developing countries, oral cancer may affect younger men and women more frequently than seen in the western world.[26,27] Buccal mucosa as a site was associated with a younger age group (<40 years) which is in contrast to the findings of Singhania who reported 50-60 years was the most common age group in his study.[18] Lip carcinoma was significantly associated with more than 60 years of age group which is consistent with the findings of Santos et al and Dominguez Gordillo who conducted a study in Spain.[28,29] Floor of the mouth was significantly associated with the age group of 40-60 years which was also reported by Midan et al.[30]

In India, Buccal mucosa carcinoma has been associated with tobacco chewing and betel quid chewing in various studies.[18,21,27-31] Placement of tobacco quid or betel quid in the buccal pouch has been attributed to the development of carcinoma. This is mainly because of prolonged placement of the betel quid in the buccal pouch to obtain a maximum effect as the constituents of betel quid produce a sense of wellbeing and increased capacity to work by stimulation of parasympathetic nervous system.[32] Similarly, smokeless tobacco tends to incite malignant degeneration at the site of tobacco placement.[33] Tobacco generates carcinogens such as tobacco specific nitrosamines and free radicals that can impede antioxidant enzymes such as glutathione S transferase, glutathione reductase, superoxide dismutase, catalase, and glutathione peroxidase.[34] Reactive oxygen species are generated in substantial amounts in the oral cavity during chewing.[35] But in our study we did not get

association between buccal mucosa and tobacco chewing because in Himachal Pradesh the habit of betel quid tobacco chewing is not highly prevalent as from our study also we found only that only 24.7% of subjects had the habit of tobacco chewing. As per GATS 2018 only 3.1% of adults use smokeless tobacco in Himachal Pradesh. Whereas prevalence of smokeless tobacco in U.P is 29.4%, Karnatka is 16.3%, Maharashtra is 24.4%.[36] About 53% of lip cancer was found in those patients who were without any tobacco and alcohol consumption and the difference was statistically significant. (p=0.030). Floor of the mouth and alveolus as a site were significantly associate with tobacco smoking (p=0.042, 0.019).

In the present study, we had almost equal number of subjects in stage II and stage IV followed by subjects in stage III. Studies conducted in other parts of India also found diagnosis of carcinoma at advanced stages.[37,38]

As oral cancers are accessible for clinical examination and amenable to diagnosis by current diagnostic tools, the problem is that most of the cases report late to the health care facility which reduces the chances of survival. As primary prevention is the potential strategy for long term disease control, education of the community regarding strengthening of tobacco free environment and prevention of oral cancer by screening for early diagnosis is recommended.

The limitation of the present study is that the data is for a specific population reporting to the hospital and not community as a whole.

CONCLUSION

Oral cancer represents 1.53% of overall cancers. There is a male predominance with male female ratio of 5:1. Peak age of occurrence is the 5th and 6th decade. Two third of the patients were chronic smokers and more than one third were alcoholics. Tongue was the most common affected site followed by buccal mucosa. Histopathologically well differentiated squamous cell carcinoma is the most common type. Buccal mucosa was significantly associated with male gender, age group of less than 40 years. Lip was significantly associated with female gender, more than 60 years and with no habits. Floor of the mouth was significantly associated with males, 40-60 years age group and tobacco smoking.

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