Original Article

Clinico-Epidemiological Profile of Oral cancer in Rural India: A Hospital Based study

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Abstract

Background: The literature suggests that the natural history of Oral cancer may vary and the prognosis is different in patients from developing and developed nations. **Objective:** To evaluate the awareness of oral cancer, its risk factors and to estimate the prevalence of risk factors in a rural population in India. **Methods:** A hospital based cross sectionalstudy was conducted through case records of oral cancer patients who reported in the year 2012 toPravara Rural Hospital Based Cancer Registry (HBCR), Department of Radiotherapy and Oncology, Rural Medical College and Pravara Rural Hospital, Loni, Maharashtra state, India. The case files and registers of Oral cancer cases was reviewed to collect personal and clinical data about sex, age, occupation, marital status, education, socioeconomic status, habits like tobacco chewers, cigarette smoking, site. A predesigned performa (a core form by HBCR programme) was used to collect the data. **Results:** In all279 cases of cancer with all sitesof oral cancer, number of male patients was 61.29% whereas females were38.71%. Mean age of the patients was 56.31 years, ranging from 11-81 years, 31.90% are more than 65 years of age. The most common cancers among the males and females are those of tongue (39.77%) and buccal mucosa (35.18%) respectively.Tobacco related cancer patients in males are 83% and in females it was 62%. **Conclusions:** The prevalence of cancer cases with all sites was higher among elderly males than in females.

Keywords: Hospital based cancer registry, Oral cancer, risk habits, retrospective study, tobacco.

Introduction

Oral cancer is traditionally defined as squamous cell carcinoma of the lip, oral cavity, and oropharynx. According to the World Health Organization (2005)1cancer might kill 10.3 million people by the year of 2020, with an increase trend in developing and newly industrialized countries1. As per the global status report published by World Health Organization,2 of the diagnosed oral cancer worldwide around 40% occur in India, Pakistan, Bangladesh and Sri Lanka.3 India has one of the highest rates in the world; accounting for one-third of the total cancers and unfortunately this figure continues to rise.2 Use of new products, blends such as panmasala and gutkha, is increasing not only among men but also among children, teenagers and women in which has also been associated with increased risk. Hence, oral cancer most commonly occurs in middle-age and older. Micronutrient deficiencies4, 5 andpoor oral hygiene6 has also been associated with increased risk. Many epidemiological studies conducted over the last three decades in America, Europe, and Asia have provided strong evidence of an association between alcohol and tobacco use and an increased risk of oral and pharyngeal tumors.7-12 Low socio-economic status is as well significantly associated with increased oral cancer risk in high and lower income-countries, across the world.13-14 National Cancer Registry Programme of Indian Council of Medical Research reported highest number of oral cancers worldwide with up to 80,000 new cases annually (ICMRNCRP, 2011).Global Adult Tobacco Survey (GATS) data from

Indian states and union territories conducted during 2009-2010, has reported approximately 274.9 million tobacco users in India. As per this report more than one-third (35%) of adults use tobacco in some form or the other, 163.7 million are users of only smokeless tobacco, 68.9 million only smokers, and 42.3 million users of both smoking and smokeless tobacco (Ministry of Health and Family Welfare, India, 2010).However, there was no report about the socio-demographic factors as independent risk for oral cancer in India. Hence, the aim of this study was to reveal the clinic epidemiological pattern of oral cancer cases in rural area of Maharashtra state, India in relationship between selected socio-demographic factors.

Aim and Objectives

1. To study the profile of Oral cancer cases registered into Pravara Rural Hospital Based Cancer Registry during the period January to December 2012.

2. To undertake a descriptive epidemiological study to assess the distribution of oral cancer in rural area - focusing on the level of area-based socioeconomic deprivation and whether this pattern has changed over time.

3. To systematically review the study literature from around the world to determine the risk of oral cancer associated with low socioeconomic status

Material and Methods

Setting of study

The study population comprised 279 patients diagnosed with oral carcinoma at the Department of Radiotherapy and Oncology, Rural Medical College and Pravara Rural Hospital, Loni, Maharashtra state, India during the period January 2012 to December 2012. The Pravara Rural Hospital is recognized as a Hospital Based Cancer Registry (HBCR) (Code-513) in rural area of Central Maharashtra by National Cancer Registry Program (NCRP) of Indian Council of Medical Research, (ICMR), Government of India. This is a specialty centre for the management of cancer referred by medical practitioners, medical officers of government / private medical institutions from various parts of Maharashtra state, and neighboring districts.

Population Study

A hospital based cross sectional study was conducted through case records of oral cancer patients who reported in the year 2012 (January to December) to Pravara Rural Hospital Based Cancer Registry (HBCR), Department of Radiotherapy and Oncology, Rural Medical College and Pravara Rural Hospital, Loni, Maharashtra state, India. The case files and registers of Oral cancer cases was reviewed to collect information of all aged, diagnosed and confirmed by histopathological results and classified by the standard International Classification of Diseases (ICD-10) criterion. The personal and clinical data about sex, age, occupation, marital status, education, socioeconomic status, habits like tobacco chewers, cigarette smoking, site etc. A predesigned performa (a core form by HBCR programme) was used to collect the data Information related to education level was classified as illiterate, primary school (up to 5 years education), middle school (6-8 years of education), secondary school (9-13. 12 years of education) and graduate (including both undergraduate and postgraduate). Occupation was assessed according to respondents self reports and coded as follows; Agriculture, self-employed, professional and unemployed. Income is categorized according to modified B. G. Prasad's socio-economic classification. Religion was in two categories, Hindu and others, while in terms of marital status it was three categories; married, unmarried and others. Tobacco use categorized as ever or never use of smoking and smokeless types. Alcohol and dietary habits also were assessed according to ever or never use of these factors. A total of 279 subjects were taken for this study.

Statistical Methods

The data is presented as the numbers with percentage (prevalence) or mean with Standard Deviation (SD) as appropriate. The significance of difference between the proportions of qualitative characteristics is tested using Chi-square test of independence of attributes. All the associations were adjusted for potential confounders like age, gender; the use of tobacco and alcohol drinking. The entire data was analyzed using a Statistical Software SYSTAT version 12 (A licensed copy).

Results

Table no. 1 reveals that out of 279 cases studied 171(61.29%) are males and 108(38.71%) are females.

The age in years ranging from 18-80 years with average age being 55.30 and 57.32 years in males and females respectively.(p=0.417 by Student's t test). The majority of subjects were above the age 30 years (p=0.670). 54.83% of cases are observed in the age group of 45-69 years.

Table 1: Age and sex wise distribution of 279 oral cancer cases			
Age in years	**Males**	**Females**	**Total**
	No. (%)	**No. (%)**	**No. (%)**
00-14	0	0	0
15-19	1(0.58%)	0	1(0.36%)
20-24	1(0.58%)	1(0.92%)	2(0.72%)
25-29	2(1.17%)	1(0.92%)	3(1.07%)
30-34	10(5.85%)	4(3.70%)	14(5.02%)
35-39	12(7.02%)	5(4.63%)	17(5.88%)
40-44	16(9.36%)	5(4.63%)	21(7.53%)
45-49	15(8.77%)	10(9.26%)	25(8.96%)
50-54	20(11.69%)	17(15.74%)	37(13.26%)
55-59	18(10.56%)	16(14.82%)	34(12.19%)
60-64	24(14.03%)	12(11.11%)	36(12.90%)
65-69	27(15.79%)	19(17.59%)	46(16.48%)
70-74	13(7.60%)	10(9.26%)	23(8.24%)
75 +	12(7.02%)	8(7.41%)	20(7.17%)
Total	**171(61.29%)**	**108(38.71%)**	**279**
Mean ± SD	**55.30±11.24**	**57.32±13.56**	**56.31±10.47**

Table 2 shows the distribution of socio economic status and according to modified B. G. Prasad's socio-economic classification, almost 32.75% and 31.48% subjects showed monthly income in the range of Rs. 500 to 4999 /- in males and females respectively.

Table 2: Distribution to according to Socio Economic status of 279 oral cancer cases			
SE status*	**Males No. (%)**	**Females No. (%)**	**Total No. (%)**
Class I (Rs. 10000 & above)	4(2.34%)	3(2.78%)	**7(2.51%)**
Class II (Rs. 5000- Rs.9999)	8(4.68%)	6(5.55%)	**14(5.02%)**
Class III (Rs.3000- Rs.4999)	47(27.48%)	31(28.70%)	**78(27.96%)**
Class IV (Rs. 1500- Rs.2999)	49(28.65%)	30(27.78%)	**79(28.31%)**
Class V (Rs. 500- Rs.1499)	56(32.75%)	34(31.48%)	**90(32.26%)**
Class VI (Less than Rs. 500)	7(4.09%)	4(3.70%)	**11(3.94%)**
Total	**171(62.29%)**	**108(38.71%)**	**279**

According to modified B. G. Prasad's socio-economic classification

Table 3: Distribution according to Occupational status of 279 oral cancer cases

Occupational status	Males No. (%)	Females No. (%)	Total No. (%)
Farmer	88(51.47%)	5(4.63%)	**93(33.34%)**
Labourer	48(28.07%)	28(25.92%)	**76(27.24%)**
Housewives	-	62(57.41%)	**62(22.22%)**
Employee/Professionals	16(9.36%)	6(5.55%)	**22(7.88%)**
Unemployed/Students	13(7.6%)	4(3.70%)	**17(6.09%)**
Others	6(3.51%)	3(2.98%)	**9(3.23%)**
Total	**171(62.29%)**	**108(38.71%)**	**279**

Table 3 reveals that majority of the cases belonged to agriculture sector (33.34%,)followed by labourers(27.24%) and housewives (22.22%) respectively. The self-employed and other numbers were higher in males than in females.

Table 4: Distribution according to Literacy status of 279 oral cancer cases

Literacy status	Males No. (%)	Females No. (%)	Total No. (%)
Literate	71(41.52%)	41(37.96%)	**112(40.14%)**
Illiterate	100(58.48%)	67(62.04%)	**167(59.86%)**
Total	**171(62.29%)**	**108(38.71%)**	**279**

Table 4 shows education level, illiterate number was higher for females (62.04%) as compared to males (58.48%). The difference was more significant for higher level education, where in the percentage of high school and above education was more in males compared to females (p, 0.01).

Table 5: Distribution according to various sites of 279 oral cancer cases

Oral cancer sites	Males No. (%)	Females No. (%)	Total No. (%)
Lip	6(3.51%)	4(3.70%)	**10(3.58%)**
Tongue	68(39.77%)	37(34.26%)	**105(37.63%)**
Floor of mouth	7(4.09%)	1(0.92%)	**8(2.87%)**
Buccal mucosa	53(30.99%)	38(35.18%)	**91(32.62%)**
Cheek	10(5.84%)	8(7.41%)	**18(6.45%)**
Alveolus	19(11.11%)	13(12.03%)	**32(11.47%)**
Palate	4(2.34%)	5(4.63%)	**9(3.22%)**
Other part of mouth	4(2.34%)	2(1.85%)	**6(21.50%)**
Total	**171(62.29%)**	**108(38.71%)**	**279**

Value of $\div^2$ = 4.662, p=0.7012, d.f. =7, not significant

Table 6: Distribution of tobacco related habits in males and females of oral cancer cases (Multiple responses)

Risk habits	Male (n=171) No. (%)	Female (n=108) No. (%)	Total (n=279) No. (%)
With risk habits*	142(83.04%)	68(62.96%)	**210(75.26%)**
Individual risk habits	81(47.37%)	63(58.33%)	**164(29.03%)**
Chewing*	**57(33.33%)**	**54(50%)**	111(39.78%)
Betel quid	3(1.75%)	34(31.48%)	**37(13.26%)**
Betel quid+ tobacco	1(0.58%)	2(1.85%)	**3(1.07%)**
Alternative (Gutkha /khaini / panmasala)	53(30.99%)	18(16.66%)	**71(25.46%)**
Smoking*			
Beedi	20 (11.69%)	2(1.85%)	**22(7.88%)**
Cigarette	3 (1.75%)	1(0.92%)	**4(1.43%)**
Snuff dipping	-	-	**-**
Alcohol	3 (1.75%)	-	**3(1.07%)**
Multiple risk habits*	59(34.50%)	8(7.41%)	67(24.01%)
Chewing+smoking	24(14.03%)	3(2.78%)	**7(9.67%)**
Chewing+alcohol	10(5.84%)	1(0.92%)	**11(3.94%)**
Smoking+alcohol	14(8.19%)	-	**14(5.02%)**
Chewing+smoking+ alcohol	11(6.43%)	1(0.92%)	**13(4.66%)**
None of the risk habits*	29(16.95%)	40(37.03%)	**69(24.73%)**

* p<0.01, significant.

Table 5 represents the site distribution, clinical and pathological feature of oral cancer which included 279 cases registered during the study period, tongue were the most frequent single as 37.63% followed by buccal mucosa 32.62%, alvelous 11.47%, cheek 6.45%, lip 3.58%, palate 3.22%, floor of mouth 3.2.87% and other part of mouth 2.15%. Also, it is observed that tongue is more common in males (39.77%) as compared to females (34.26%) and buccal mucosa is more in females (35.18%) than in males (30.99%).

Table 6 illustrates distribution of risk habits according to gender. Out of 210 with risk habits oral cancer cases 83.04% are males and 62.96% are females. Out of 111 oral cancer patients the individual habits like Chewing, 33.33% was males and 58.33% was females respectively. The individual habits like Chewing betel quid (37; 13.26%), betel quid with tobacco (3; 1.07%) and (71; 25.46 %); alcohol intake was reported among 3(1.75%) males only.

Smoking of beedi /cigarette (22; 7.88%)/ (4; 1.43%),

alcohol intake (3; 1.07%) and multiple risk habits were predominantly reported among (59; 34.50%) males, of those (24; 14.03%) had combined habit of chewing + smoking and rest (35; 20.46%) had multiple risk habit of alcohol combined with smoking /chewing alone or both.

Discussion

In this study, the low degree of educational status was widespread. The majority of cases had agriculture farming and labourer as a source of occupation. This has resulted in their monthly income level; the cases had relatively lesser income.

The study thus, suggests that the risk of oral cancer is inversely proportional to increasing level of education and economical status. It is further confirmed by multivariate analysis, which shows that education, particularly low education, occupation, agriculture labourer and unemployment and low monthly household income were the

significant independent risk factors. These findings are consistent with the similar studies done in the other parts of India by Chattopadhyay;[15]Sankaranarayananet al[16] and Rao et al[17] reported earlier.

By univariate analyses suggest that all socio-demographic factors to be significant risk in this study. Women with oral cancer were more affected by socio-demographic factors, particularly, education, occupation and income. Our findings are supported by Hebert et al[18] and Sorensen et al[19] which they believe that social and demographic characteristics are in relation to oral cancer. It may be due to effect of sociodemographic characteristics, in particular, education and occupation on tobacco use among men; therefore, it can effect on development of oral cancer.

Cancer in general is multi-factorial in origin and several environmental interactions are possible. Age, gender, illiteracy or low education level, occupation; working in agriculture sector, income; low monthly household income, marital status and married people resulting in smoking, chewing, drinking and dietary habits can be considered as significant contributing factors modifying the multistage process of carcinogenesis.

Conclusion

Results of the present study revealed the differences in the habits according to verities in socio-demographic characteristics between oral cancer patients which suggest that socio-demographic factors do play an important role. The social awareness through the education programs about the risk of oral cancer in India is highly warranted. The comprehensive cancer control program emphasizing on the rural and remote places is the need of the hour. This can definitely decrease the incidence and also can help in presentation of cancer at an early stage at which they can be curable.

Recommendations for optimum cancer registration as a whole and specifically for primary prevention of oral cancer include

1. Adoption of a standard recording system of registration to achieve considerable validity of data and to ensure complete case ascertainment.

2. Incorporating the quality control procedure of cancer registration throughout the use of the registry and optimal results will be obtained through closed loop of feed backing.

3. Quitting tobacco would greatly limit deaths from these tumors.

4. Regular professional oral examination needs to be emphasized, and early detection of OPC will greatly improve not only survival rates but also quality of life as a consequence of less radical and therefore debilitating treatment.

5. Suspicious oral lesions should be promptly biopsied thereby early diagnosis and treatment

Acknowledgement

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