

Original Research Article

Evaluating the epidemiology and needs of oral cancer patients from Aurangabad district, Maharashtra, India

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Received: 24 May 2017

Accepted: 27 May 2017

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ABSTRACT

Background: India is facing burden of non-communicable diseases and oral cancer is one of the leading public health issue. This is a descriptive study from Aurangabad district, Maharashtra, India to evaluate epidemiologic profile of oral cancer patients who underwent treatment during 2012 to 2016.

Methods: Demographic and clinical profile of 500 patients was recorded with validated questionnaire.

Results: With male: female ratio was 2.90:1; the mean age of the patients of oral cancer was 47.73 years. Tobacco consumption was the leading cause associated with statistically significant association (p value < 0.000) among the gender and tobacco use suggesting men are more prone to use tobacco than women. 74% patients received satisfactory treatment and all the patients strongly reported need of doctor's advice, family support, discontinuation of substance abuse habits and financial help. Patients reported the need of acceptance by society and good diet and nutrition. However, many denied the need of psychological counseling and regular check-up. There was statistically significant association (p value < 0.001) found among the gender and needs for good diet and nutrition, psychological counseling, regular check-up, discontinuation of tobacco habits. Statistically significant association (p value < 0.001) found among the occupation and needs for good diet and nutrition, psychological counseling and acceptance by society.

Conclusions: The study projects the epidemiology and focuses on the needs of the patients which require the specific attention and efforts through patient's education and awareness.

Keywords: Cancer epidemiology, India, Needs of patients, Oral cancer, Oral health, Tobacco

INTRODUCTION

Oral health is equally important to general health and is complimentary to each other. Apart from esthetic appearance, a healthy and well-functioning dentition is necessary at all stages of life supporting essential human functions, for instance speaking, smiling, socializing and eating. Oral diseases may directly affect a limited area of the human body, but their consequences and impacts affect the body as a whole.¹ Oral cancer is sixth most commonly occurring and debilitating type among the

head and neck cancer diseases with approximately 263,000 new cases per year.² India has largest prevalence of oral cancer patients among South Asian countries.³ It is the third most common cancer and accounts for almost 40% deaths. Among the men it's second most common site and among women it's fourth.⁴ At national level, in 2012, the incidence rate for male was 10.1/1, 00,000 and for female 4.3/1, 00,000.⁵ India has National Cancer Registry Programme (NCRP) since last thirty years.⁶ NCRP has established Population Based Cancer Registries (PBCRs) across the country which provides

authentic data on incidence and mortality of cancer in various parts of the nation for a defined period.⁷ Aurangabad district is the headquarters of Marathwada, a geographic division of Maharashtra state. It covers an area of 10100 km² having a population of 3,695,928 (2011 Census).⁸ Aurangabad Cancer Registry, one of the PCBR, with collaboration of Indian cancer society has published during 2010, 545 incident cases registered out of which 260 Males and 285 Female.⁹ With the new publication of data from 2012 to 2014, the incidence of oral cancer was second highest among males after lung cancer and for female's oral cancer ranked fifth after breast cancer.

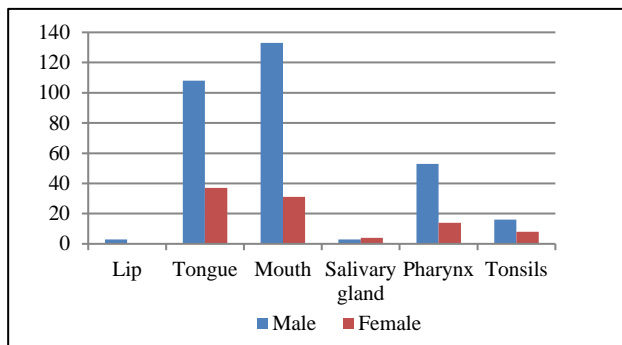


Figure 1: Adapted from Aurangabad cancer registry data 2012-2014.

Following graph (Figure 1) shows the incidence cases among gender and site-specific data of oral cancer from Aurangabad region.¹⁰ Many independent researchers had reported the wide ranged prevalence of oral cancer and its risk factors in various parts of the country, but there is scant literature concerning the risk factor profile of oral cancer patients in Aurangabad.^{9,10} It is imperative to identify and quantify the etiological profile, socioeconomic profile, treatment availability, determine the behavioural patterns, habits and needs of the affected population. We attempt to evaluate the demographic, clinical and risk profile of oral cancer patients reported in hospital-based cancer registry in Aurangabad in 2012-2016. The purpose of this study was to evaluate, retrospectively, the epidemiologic profile of oral cancer patients from Aurangabad district of Maharashtra state in India.

METHODS

A descriptive study of 500 Oral cancer patients who have undergone treatment (surgical, chemotherapy, radiotherapy and rehabilitation) at the various Hospitals of Aurangabad, since 2012 to 2016 was carried out. Majority of the patients were below poverty line as they were treated under government health insurance scheme. The institutional ethics committee of NCRD's Sterling Institute of Pharmacy, Navi Mumbai, India cleared the study protocol and the data pertaining to these patients was entered in a standardized questionnaire with informed consent. This included medical history, age, gender, occupation, habits of tobacco consumption, treatment satisfaction and patient's perception of their needs in terms of doctor's advice, financial help, psychological counseling, family support, regular check, discontinuing tobacco habits and societal acceptance.

The statistical data analysis using SPSS version 23 (SPSS Inc., Chicago, IL, USA) included descriptive statistics looking at frequency distribution of the variables. The continuous variables such as in demographics, number of male and female patients, economic condition, substance abuse habits were described using mean with 95% confidence interval. The level of significance was set at 5% (p<0.05). Correlation using chi-square test between the two variables, i.e., gender to habits, occupation to habit, gender to psychological counseling, gender to family support need of the patient were done.

RESULTS

There were 500 cases of oral cancer patients who have undergone treatment in 2012 to 2016. Three hundred seventy-two (74.4%) were male and 128 (25.6%) were females, with male: female ratio was 2.90:1. In all age groups, number of males was more than female subjects. Among males and females, the highest incidence of oral cancer, 172 (34.4%) was seen within the age group of 41-50 (P < 0.000) followed by age group 51 to 60 years (27.6%). [Table 1]. The least number of patients was in the age group 21-30 years (7.4%). The mean age of the patients of oral cancer was 47.73 years. The age distribution is shown in Table 2.

Table 1: Distribution of cases based on gender and age-group (n = 500).

| Age group (years) | Total no. of patients, n (%) | ±Males, n (%) | ±Females, n(%) | *P value |
|-------------------|------------------------------|---------------|----------------|----------|
| 21 - 30 | 37 (7.4) | 37 (9.9) | 0 (0) | 0.000 |
| 31 - 40 | 68 (13.6) | 45 (12.1) | 23 (18) | |
| 41 - 50 | 172 (34.4) | 129 (34.7) | 43 (33.6) | |
| 51 - 60 | 138 (27.6) | 88 (23.7) | 50 (39.1) | |
| 61 - < | 85 (17) | 73 (19.6) | 12 (9.4) | |

*P value obtained by Chi-square test. ±Percentage of all male age groups. ±Percentage of all female age groups.

The occupation of the patients was recorded and is reported in Table 2. The most frequent occupation was labor work (N=161, 32.2%), followed by farming (N=138, 27.6%). The P value calculation suggests the statistical significant association of oral cancer with labor work occupation. Tobacco consumption, both smoked and smokeless form was prevalent among both genders as shown in Table 3. There was statistically significant association among the gender and tobacco use suggesting men are more prone to use tobacco than women.

However, interestingly all the patients who reported to use tobacco revealed that they discontinued use of tobacco immediately after diagnosed with oral cancer. Occupation wise, patients who were laborer (N=161, 42%), were most common among the tobacco users followed by the farmers (N=105, 27.4%). Patient with labor work use more tobacco and have oral cancer than others as it shows statistically significant association with p value less than 0.001 (Table 4).

Table 2: Distribution of cases based on gender and occupation (n = 500).

| Occupation | Total no. of patients, n (%) | ±Males, n (%) | ±Females, n (%) | *P value |
|--------------------|------------------------------|---------------|-----------------|----------|
| Farmer | 138 (27.6) | 91 (24.5) | 47 (36.7) | 0.000 |
| Labourer | 161 (32.2) | 106 (28.5) | 55 (43) | |
| Government servant | 52 (10.4) | 48 (12.9) | 4 (3.1) | |
| Self employed | 51 (10.2) | 41 (11) | 10 (7.8) | |
| Unemployed | 98 (19.6) | 86 (23.1) | 12 (9.4) | |

*P value obtained by Chi-square test. ±Percentage of all male age groups. ±Percentage of all female age groups.

Table 3: Distribution of cases based on gender and tobacco user (n = 500).

| Tobacco use and discontinuation of tobacco after diagnosis | Total no. of patients n (%) | ±Males n (%) | ±Females n (%) | *P value |
|--|-----------------------------|--------------|----------------|----------|
| Yes | 383 (76.6) | 300 (78.3) | 83 (21.7) | 0.000 |
| No | 117 (23.4) | 72 (61.5) | 45 (38.5) | |

*P value obtained by Chi-square test. ±Percentage of all male age groups. ±Percentage of all female age groups.

Regarding the treatment received, 370 (74%) patients reported that they received satisfactory treatment and 130 (26%) reported that they did not. Among these, 78% men and 62.5% women reported satisfactory treatment received with statistically significant association (p value 0.001).

favor of need of any psychological counseling and regular checkup. There was statistically significant association found among the gender and needs of the patient particularly for good diet and nutrition, psychological counseling, regular checkup, discontinuation of tobacco habits with p value less than 0.001.

The results about the needs of the oral cancer patients are mentioned in Table 5. All of the patients (N= 500, 100%) strongly reported that they need doctor’s advice, family support, discontinuation of substance abuse habits and financial help. Maximum number of patients reported the need of acceptance by society and good diet and nutrition. However, many of the patients were not in

Also, statistically significant association found among the occupation and needs of the patient particularly for good diet and nutrition, psychological counseling and acceptance by society with p value less than 0.001. This is described in Table 6.

Table 1: Distribution of cases based on occupation and tobacco user (n = 500).

| Occupation | Total no. of patients, n (%) | ±Tobacco user, n (%) | ±Non-tobacco user, n (%) | *P value |
|--------------------|------------------------------|----------------------|--------------------------|----------|
| Farmer | 138 (27.6) | 105 (27.4) | 33 (28.2) | 0.000 |
| Labourer | 161 (32.2) | 161 (42) | 0 (0) | |
| Government servant | 52 (10.4) | 52 (13.6) | 0 (0) | |
| Self employed | 51 (10.2) | 51 (13.3) | 0 (0) | |
| Unemployed | 98 (19.6) | 14 (3.7) | 84 (71.8) | |

*P value obtained by Chi-square test. ±Percentage of all tobacco users. ±Percentage of all non-tobacco users.

Table 5: Frequency of needs of the oral cancer patients (n = 500).

| Needs of the patients | Yes, n (%) | No, n (%) |
|---|------------|------------|
| Doctor's advice | 500 (100) | 0 (0) |
| Good diet and nutrition | 318 (63.6) | 182 (36.4) |
| Psychological counseling | 155 (31) | 345 (69) |
| Regular check up | 197 (39.4) | 303 (60.6) |
| Family support | 500 (100) | 0 (0) |
| Discontinuation of any substance abuse (tobacco) habits | 500 (100) | 0 (0) |
| Financial help by NGO/Govt/job/insurance | 500 (100) | 0 (0) |
| Acceptance by society | 434 (86.8) | 66 (13.2) |

Table 2: Paired samples correlations of gender and occupation of oral cancer patients with their specific needs (n = 500).

| Group | N | Correlation* | Significance value, (P)* |
|---|-----|--------------|--------------------------|
| Pair 1 Gender and needs for good diet and nutrition | 500 | 51.184 | 0.000 |
| Pair 2 Gender and needs for psychological counseling | 500 | 51.280 | 0.000 |
| Pair 3 Gender and needs for regular check up | 500 | 38.450 | 0.000 |
| Pair 4 Gender and needs for discontinuation of tobacco habits | 500 | 13.266 | 0.000 |
| Pair 5 Occupation and needs for good diet and nutrition | 500 | 426.097 | 0.000 |
| Pair 6 Occupation and needs for psychological counseling | 500 | 124.364 | 0.000 |
| Pair 7 Occupation and needs for acceptance by society | 500 | 256.935 | 0.000 |

*P values and Correlation values obtained by Chi-square test.

DISCUSSION

Shenoy et al reported in their study that the male: female ratio was 4.18:1 at Nagpur, a district in Maharashtra state¹¹, while it was 2.90:1 in this study, Prevalence of oral cancer is always high among men than women due to the indulgence of tobacco abuse and other risk behaviours. Indian men are prone to consumption of tobacco and betel nut along with alcohol which act as stimulant to oral cancer.

It is observed that the risk of developing oral cancer increases with age, mostly affecting in 5th decade of life. Earlier, US National Cancer Institute reported the mean age of diagnosis of oral cancer is 65 years.¹² However, a gradient shift to early age i.e. under the age of 45 years is currently observed in the high incidence countries of world. There is rising incidence in oral cancer and mortality rates in young adults are reported from many countries including the European Union and parts of United States.¹³ In an earlier study from Eastern India, mean age was found 52.07 year¹⁴, while a recent 2012 study reported the mean age of patients of oral cancer from Maharashtra was found to be 49.73 years.¹¹ We found the highest incidence of oral cancer, 172 (34.4%) within the age group of 41-50 (P < 0.000) with mean age of 47.73 years. This is contrary to previous studies stating that incidence of oral cancer in Indian population is seen a decade earlier than western population younger population is seen equally with the projected trends in the world.¹⁴⁻¹⁶ Traditionally oral cancer was considered as a disease mainly affecting people of older ages, a

substantial proportion of cases arise in the third and fourth decades of life.⁴ The easy access, availability and affordability to tobacco and related products, lack of awareness and tendency for adopting to risk behaviours are the baseline reasons for this stable trend in incidence of oral cancer. Hay JL and his colleagues found that on average, most participants did not feel at high risk for developing oral cancer, with most (77%) reporting their risk for oral cancer was less than, or equal to, that of others of their age and sex; and 31 and 19% of current smokers perceived their oral cancer risk as less than that of other smokers and other non-smokers, respectively.¹⁸ These findings support the need for health education materials that incorporate oral cancer risk perception of high-risk individuals. Up to 70 % of oral cancers are preceded by precancerous oral lesions, such as persistent red or white patches in the mouth. Oral health professionals are in a strong position to screen high-risk patients for early signs of oral cancer, yet the opportunity for a simple oral examination is frequently missed. Regular visits to dentist for thorough oral health check-up is imperative.¹⁹

Shenoy et al and Almodovar et al found farming was the most frequent occupation of patients with squamous cell carcinoma in their study, while labor work occupation was mostly affected with oral cancer followed by farming in this study.¹¹⁻²⁰ More exposure to sunlight UV rays, indulgence for substance abuse as stimulant for work, lack of education and awareness about oral cancer, and low socio-economic status can explain this fact. The

association between low socioeconomic status (SES) and oral cancer incidence risk is also significant. Conway et al found in their systematic review that low SES was significantly associated with increased oral cancer risk in high and lower income-countries, across the world, and remained as such after adjusting for potential behavioural confounders. Forty-one studies provided 15,344 cases and 33,852 controls which met our inclusion criteria. Compared with individuals who were in high SES strata, the pooled ORs for the risk of developing oral cancer were 1.85 (95% CI 1.60, 2.15; n = 37 studies) for those with low educational attainment; 1.84 (1.47, 2.31; n=14) for those with low occupational social class; and 2.41 (1.59, 3.65; n=5) for those with low income.²¹

We found that 76.6% patients had a habit of tobacco consumption. According to Murthy and Mathew, the pivotal risk factors for cancer are tobacco, alcohol consumption, infections, dietary habits and behavioural risk factors.¹⁷ Oral cancer is predominantly a preventable cancer with tobacco consumption as avoidable risk factors. Between 25 and 30% of all cancers in developed countries are tobacco-related.²² India is the third largest producer and consumer of tobacco with a long history of tobacco use in a variety of ways of chewing and smoking. The habits of chewing (15-70%) and smoking (23-77%) vary considerably from area to area. Tobacco-related cancers attributes for nearly 50% of all cancers among men and 25% of all cancers among women. The burden of tobacco-related cancers in India by 2001 has been estimated to be nearly 0.33 million cases annually. It is predicted that there will be 7-fold increase in incidences of tobacco-related cancer morbidity between 1995 and 2025 and 220% increase of cancer deaths.¹³ In a study from south India, a multiplicative interaction between the consumption of alcohol and tobacco products, respectively, was observed to induce a 24- fold increase in risk for oral cancer.⁴ It is important to mention that all the patients quit the use of tobacco when they are diagnosed with oral cancer.

Besides tobacco consumption, lower intake of fresh foods, green vegetables and high cooking temperature in Indian dishes are responsible for cancer of mouth and pharyngeal cancer. The dietary factors might contribute to high risk of hypopharyngeal cancer in India.²³ In addition to tobacco and alcohol, dietary deficiency particularly vitamin A and iron are implicated in the etiology of hypopharyngeal cancer.²⁴ Low socio-economic status means having less affordability to proper food and hygienic conditions, indicating poor nutrition leading to deficiencies. This study found that the needs of the patients for good diet and nutrition were 63.6%.

With the recent advances in oral cancer treatment and maxillofacial rehabilitation, the survival of such patients has increased. Surgery is the mainstay in the treatment of patients with oral cancer.²⁵ In this study 74% patients

reported that they received satisfactory treatment and all the patients reported that they need doctor's advice further. On the contrary, 60.6% felt they do not need regular check-up which is an important aspect of cancer treatment. Many patient's denial for regular check-up may be due to the lack of finances i.e. regular check-up=additional fees for treatment. Maximum patients belong to low income group and may have lost their work after cancer treatment. There was statistically significant association between gender and need for regular check-up where women are more desirous for it than men.

Among the oral cancer survivors, Depression is the most common emotional distress experienced.²⁶ Studies assessing the psychological status of oral cancer patients indicate that the depressive symptoms impact of the disease and its treatment are substantial and that is estimated to have prevalence from 22% to 32% in oral cancer survivors including loss of energy and hopefulness, appetite changes, sleep disturbances, fatigue, facial disfigurement and isolation.²⁷⁻²⁹ Failure to identify and deal with depression generally reduces the quality of life.³⁰ Here, in this study, 69% said that they do not need any psychological counseling. Patients here belonged to low socio-economic group where visiting a psychiatrist is still considered as taboo. There was strong need felt by the patients for financial help and acceptance by society, subtly.

CONCLUSION

The ever-increasing burden of oral cancer is not fully appreciated even within India, despite the high incidence and poor survival associated with this disease. Gupta et al reviewed current rates of incidence, mortality and survival, and investigated the determinants of disease and current prevention strategies in India.⁴ They found that in addition to tobacco smoking and the myriad other forms of tobacco use prevalent in India, risk factors include areca nut consumption, alcohol consumption, human papillomavirus, increasing age, male gender and socioeconomic factors. Further, the focus of health care services remains clinical and is either curative or palliative. Studies evaluating QOL in post-operative oral cancer cases found that socio-economic status, psychosocial factors, cancer stage are the main determinants of QOL. They also found that oral cancer survivors lived with a worse HRQL compared with the general population.^{31,32}

This study is a descriptive hospital-based and it reflects results only for a specific population which results cannot be attributed for general population. Maximum number of patients, both males and females were in the age group of 41-50 years, followed by a close margin in the 51-60 years age group. Most patients belonged to a lower socio-economic status. Maximum patients were prone to tobacco related risk behaviors. This study adds the evidences about epidemiology and needs of oral cancer patients from Aurangabad district (MS) of India.

Oral cancer support needs are highly subjective and varied in every case. Although a common factor would be to improve QOL with management functioning, swallowing and nutritional compromise and psychological effects of cancer and treatment. These can be achieved with health education. Health education via psycho-educational interventions encompass a broad range of activities that includes providing patients with information about treatments, symptoms, resources and services, training to provide care and respond to disease-related problems, and problem-solving strategies for coping with cancer. Interventions may include use of booklets, videos, audiotapes, and computers, and formats may be interactive between healthcare professionals and patients and caregivers, self-directed via use of CDs and other materials, online, or delivered telephonically. Moreover, programs should be developed emphasizing the early diagnosis due to its impact on patient's survival rate, quality of life, and treatment costs.^{11,29,33,34} With such knowledge, an appropriate multidisciplinary intervention program involving different health professionals can be developed and evaluated.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Niranjan VR, Ranpise SG. Evaluating the epidemiology and needs of oral cancer patients from Aurangabad district, Maharashtra, India. *Int J Res Med Sci* 2017;5:2905-11.