

# An epidemiological survey in hospital setup in Lucknow district: A cross-sectional study

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## ABSTRACT

**Introduction:** Oral cancer is the sixth most common form of cancer reported globally which includes lip, tongue, mouth, and throat. Developing countries face several challenges to identify and remove potential risk factors. Chewing tobacco/pan masala is considered to be the most potential risk factor for oral precancerous lesions and oral cancer. **Objective:** To study the clinical-epidemiological profile of oral cancer cases and potential risk factor associated with it. **Materials and Methods:** This is cross-sectional study which includes all major tertiary hospital in Lucknow district. Five hundred and eight cases of oral cancer reported in all major tertiary hospitals in Lucknow district during 2013–2016. **Study Variable:** Clinicoepidemiological characteristics of oral cancer cases. **Statistical Analysis:** percentages, proportions. **Results:** Out of 508 cases, majority of the subjects included in the study belonged to 18–75 years age group. Reported cases of oral cancer in males were higher as compared to females. Most of the subjects belonged to lower middle and upper lower socioeconomic group. It was found that 199 (39.2%) subjects consumed smokeless tobacco. Buccal mucosa was the common site of oral cancer being present in 50.4% of the subjects. Histopathologically, 256 cases of buccal mucosa, 17 cases of lip, 33 cases of alveolar region, 16 cases of mandible region, 156 cases of tongue region, 7 cases of gingival buccal sulcus region, and 23 cases of palate were diagnosed as oral squamous cell carcinoma. **Conclusion:** In the present study, the most affected site was buccal mucosa (50.4%), tongue (30.7%), and other diagnosis was <10%.

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**Key words:** Epidemiological study, oral cancer, potential risk factors

## INTRODUCTION


Cancer is major cause of morbidity and mortality worldwide and is one of the leading causes of death in all societies, with its relative position varying with age and sex. Oral cancer is the sixth most common cancer reported globally with an annual incidence of over 3,000,000 cases, of which 62% arise in developing

countries.<sup>[1]</sup> In India, more than 75% of reported cases of oral cancers are associated with a history of tobacco consumption in smoke or smokeless form and constitute a major public health problem.<sup>[2]</sup> According to the National Cancer Registry Programme, Indian Council of Medical Research reported the highest number of oral cancers worldwide with up to 80,000 new cases

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annually.<sup>[3]</sup> The most important risk factors for oral cancer cases are use of tobacco/betel quid and the regular drinking of alcoholic beverages. However, infection with high-risk human papillomavirus genotypes and a diet low in fresh fruits and vegetables has also recently been implicated in the etiopathogenesis of oral cancer.<sup>[4]</sup> The mutagenic effects of tobacco, alcohol, betel quid, or areca nut are dependent upon dose, upon frequency, and upon duration of use, and are accelerated and exaggerated by the concurrent use of two or more of these agents.<sup>[5]</sup>

The oral squamous cell carcinoma (OSCC) represents more than 90% of malignant neoplasms of the mouth.<sup>[6]</sup> The principal anatomic zones of OSCC are the tongue, floor of the mouth, gums, palate, oral mucosa, and other sites in the mouth. The anatomic sites affected vary based on geographical areas.<sup>[7]</sup> The International Agency for Research on Cancer has confirmed that use of smokeless tobacco causes oral cancer.<sup>[8]</sup> The Global Adult Tobacco Survey 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.<sup>[9]</sup> Incidence and survival rates of cancer are clearly linked to socioeconomic factors, low-income, and disadvantaged groups. Low socioeconomic status is as well significantly associated with increased oral cancer risk in high- and low-income countries, across the world.<sup>[10]</sup>

Many epidemiological studies about oral cancer have been done in the different parts of India and North India, but no single studies were carried out in reference to clinicoepidemiological profile of oral cancer cases and potential risk factor associated with it in respect to gender, age group, socioeconomic status, risk habits, affected oral anatomical sites in Lucknow district, Uttar Pradesh, India.

## MATERIALS AND METHODS

The present cross-sectional study was carried out in King George's Medical University and other major tertiary hospitals of Lucknow district, India. The study was carried out during 2013–2016. All the cases were reported to the outpatient department for the oral complaints and were diagnosed as oral cancer was included in the study. 7303 patients were reported during the study period. Out of which, 508 cases were diagnosed as oral cancer in Lucknow district. Data were collected from questionnaire, case history, and oral mucosal biopsy report.

### Inclusion criteria

- Males and females between 18 and 75 years of age (inclusive), which were willing to participate
- Subjects who were permanent residents of Lucknow district in this study area were included
- Subjects having premalignant oral lesion
- Subjects having a history of tobacco and alcohol use.

### Exclusion criteria

- Subjects who were not willing to participate in this study
- Subjects who were not permanent resident of Lucknow district
- Subjects having oral lesion other than premalignant lesion.

### Questionnaire

The questionnaire was piloted and modified as necessary and all its components were self-administered. Questionnaire included the question related to the use of tobacco, consumption of alcohol, oral health status, and consumption of nonvegetarian food. It was ensured that all questions were valid, nonambiguous, and fair. All the subjects were distributed according to their personal habit(s) without any adverse habit (no habit), only smokeless tobacco chewing (SLT), tobacco smoking (TS), both tobacco chewing and smoking (SLT + TS), and alcoholic with or without use of tobacco in any form (alcohol ± SLT ± TS). Duration (in years) was recorded for any type of risk habit. This study was approved by the Institutional Ethics Committee, King George's Medical University, UP, Lucknow, India (Letter no. 6303/R Cell, date: 19/12/2013).

### Statistical analysis

Statistical analysis included calculation of percentages and proportions.

## RESULTS

Chart 1 depicts the demographic characteristics of the study subjects. Majority of the subjects included in the study were 18–75 years age group. Among all of them, 446 (87.8%) subjects were male and 62 (12.2%) subjects were female. Table 1 shows occupational status of subjects, i.e., 199 (39.2%) subjects were in service, 109 (21.5%) subjects were in business, 35 (6.9%) subjects were farmer, 86 (16.9%) subjects were labors, and 79 (15.6%) were homemakers. Most of the subjects belonged to lower middle and upper lower socioeconomic status according to modified Kuppuswamy's socioeconomic scale.<sup>[11]</sup> Chart 2 depicts the tobacco habits among study subjects. 159 (31.3%) subjects consumed tobacco in smoking form such as cigarettes and bidis, 199 (39.2%) subjects were using smokeless tobacco in the form of betel quid or khaini, 85 (16.7%) subjects were using tobacco in both

chewing as well as smoking form, and 65 (12.8%) subjects were not using tobacco in any given form.

Table 2 shows the habit of alcohol among the subjects. 108 (42.0%) subjects were users of alcohol and 149 (58.0%) subjects were nonusers of alcohol. Chart 3 depicts choice of diet type. 195 (38.4%) subjects were vegetarian, 32 (6.3%) subjects were nonvegetarian, and 281 (55.3%) subjects were both vegetarian and nonvegetarian habit. Among them, there was only 1 (0.2%) subject whose habit of consuming nonvegetarian food daily, 151 (29.7%) subjects consume nonvegetarian food weekly, 165 (32.5%) subjects were consuming at occasionally, and 191 (37.6%) subjects never consumed

nonvegetarian food. Table 3 shows the history of chronic disease associated with oral cancer, 60 (11.8%) subjects were diabetic, 38 (7.5%) subjects were hypertensive, 4 (0.8%) subjects had chronic heart disease, 01 (0.2%) subject were asthmatic, and other 405 (79.7%) subjects of without history of chronic diseases. Chart 4 depicts histopathologically 256 cases of buccal mucosa, 17 cases of lip, 33 cases of alveolar region, 16 cases of mandible region, 156 cases of tongue region, 7 cases of gingival buccal sulcus region, and 23 cases of palate were diagnosed as OSCC.

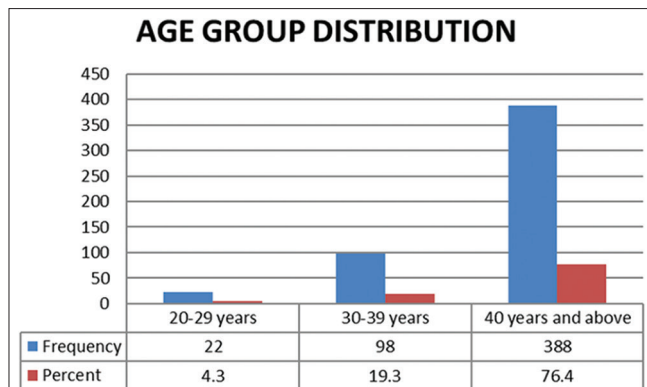


Chart 1: Distribution of study subjects according to sociodemographic characteristics

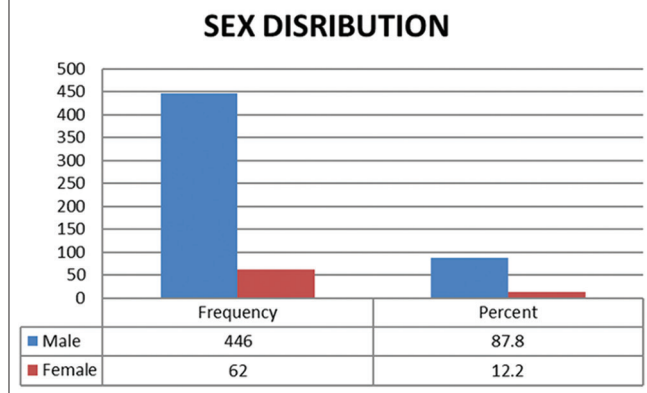


Table 1: Distribution of study subjects according to occupation

Occupation	Frequency (%)
Service	199 (39.2)
Business	109 (21.5)
Farmer	35 (6.9)
Labor	86 (16.9)
Homemaker	79 (15.6)
Total	508 (100.0)

Table 2: Distribution of study subjects according to alcohol habit

Alcohol habit	Frequency (%)
Yes	108 (42.0)
No	149 (58.0)
Total	257 (100.0)

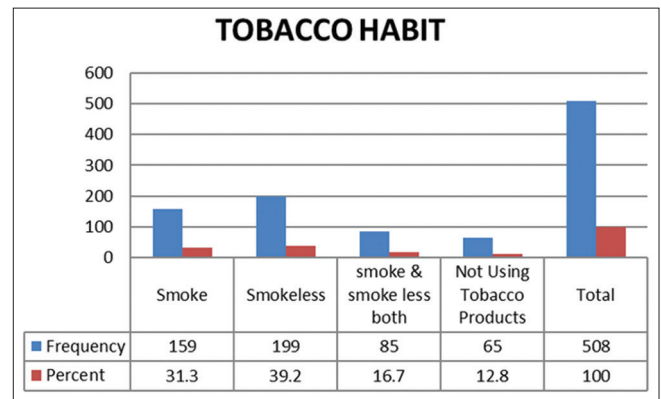


Chart 2: Distribution of study subjects according to tobacco habit

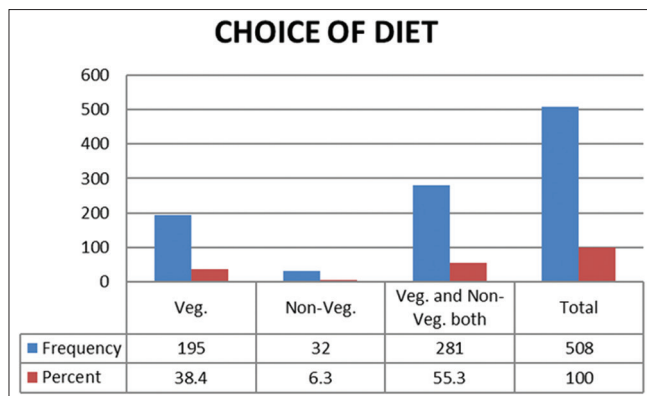


Chart 3: Distribution of study subjects according to diet choice

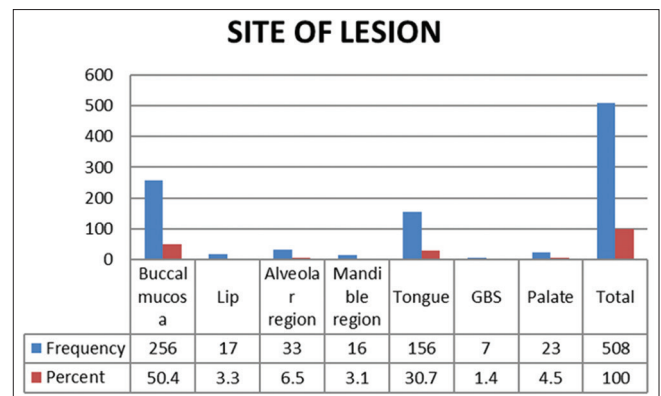


Chart 4: Distribution of study subjects according to lesion site

**Table 3: Distribution of study subjects according to history of chronic disease**

History of chronic disease	Frequency (%)
Diabetes	60 (11.8)
Hypertension	38 (7.5)
Chronic heart disease	4 (0.8)
Asthma	1 (0.2)
No chronic disease	405 (79.7)
Total	508 (100.0)

## DISCUSSION AND CONCLUSION

Oral cancer is one of the most common cancers among males in India.<sup>[12,13]</sup> Khandekar *et al.*<sup>[14]</sup> has found 80 oral cancer cases at Government Dental College and Hospital, Nagpur. Out of them, 49 cases were male and 31 cases were female. The ratio of male and female was 1.5:1. Higher incidence proportion of cases among males can be related to higher prevalence of tobacco consumption in all forms among males. Their indulgence into the habit is due to attractive presentation, cheap prices, and easy availability supported by lack of knowledge about its devastating effects. Comparatively, there was a fewer user among the females which may be related to fewer chances of availability of tobacco and alcohol. The lower socioeconomic status may also be a risk factor for poor oral hygiene thereby further increasing the risk of oral cancer in tobacco consumers. Balaram *et al.* have shown similar findings in their study.<sup>[15]</sup>

Epidemiological studies have shown that the sites of occurrence for oral cancer differ widely habit. Tongue, lip, and floor of the mouth are the most frequent sites of lesions of squamous cell carcinoma in the oral cavity.<sup>[16-20]</sup> The study in Western UP reported that the most common site was buccal mucosa, followed by the retromolar area, floor of mouth, lateral border of tongue, labial mucosa, and palate.<sup>[21]</sup> In this study, buccal mucosa was the most frequent site because most of the patients tend to keep the tobacco in the form of quid in the buccal sulcus with proximity to alveolus. This in turn led to constant irritation with chemical and physical insult of gingiva. Other studies<sup>[22,23]</sup> have shown that the lip is the most constant site of squamous cell carcinoma in the oral cavity even though the tongue was the second site in the majority of these studies.

In other recent Northern Indian population study,<sup>[24]</sup> the result shows that there was a significant association between OSCC with middle age group, i.e. 41–60 years. Cases with both habits of tobacco chewing and smoking were at higher risk for OSCC than tobacco chewing alone, duration of risk habits also emerged as a responsible factor of carcinoma and buccal mucosa was the most common affected oral site.

The study of Subapriya *et al.* in 2007<sup>[25]</sup> shows that addiction of alcoholic drink and consumption of

nonvegetarian food frequently cause increase the risk of oral cancer higher. Same findings were also find in the research study of Gangane *et al.*<sup>[26]</sup> on assessment of risk factors for OSCC in Chidambaram, South India. Some recent study shows patients having chronic diseases such as diabetes, hypertension, and asthma and who smoke and consume alcohol may constitute a relatively high-risk group for developing oral cancer.<sup>[27,28]</sup>

Our present study result shows that the most common site of oral cancer was buccal mucosa followed by tongue, alveolus, lip, mandible, and palate, and majority of cases was in advanced stage. From all of the cases, the subjects had habit of consuming tobacco. The oral cancer is typical habit of consuming smokeless tobacco in the form of gutka, khaini, mawa, and some other form. Smoking also seems to be highly associated with the development of oral cancer. Outcomes of the present study revealed that the high incidence of oral cancer in Lucknow is due to high exposure of tobacco in either smokeless or smoke form. Our results shows that the addiction of alcoholic drink and consumption of nonvegetarian food frequently was also found to be significantly associated with the risk of oral cancer.

Although oral cancer occur at a site which is accessible for clinical examination and amendable to diagnosis by current diagnostic tools, the crux of the problem is that majority of the case reports late to the health-care facility as evident from the finding of the present study<sup>[15,29]</sup> which reduces the chances of survival and our study have shown that detecting oral cancer in early stage, when these are amendable to single modality therapies, offer the best chance of long-term survival.<sup>[30]</sup>

In the present study, it was found that some patients having history of chronic diseases and also had the habit of taking tobacco with or without alcohol were also associated with oral cancer. However, further research is needed to obtain appropriate epidemiologic data and establish the mechanisms involved in this process. Thus, on the basis of finding of the present study, there is an immediate need for creating a campaign regarding awareness in all age groups, especially children against the use of these addictive carcinogenic substances. The result shows the increasing rate of cancer among the low socioeconomic status of the society. However, this study is a preliminary investigation and represents an addition to the data on incidence and associated risk factors. Increased awareness by education is very important and may play a preventive role.

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**Conflicts of interest**

There are no conflicts of interest.

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