



## ASSESSMENT OF ORAL CANCER: A STUDY IN NEPAL CANCER HOSPITAL AND RESEARCH CENTER, HARISIDDHI, LALITPUR, NEPAL

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### ABSTRACT

Oral cancer is becoming very common and increasing day by day in Nepal. It ranks 6<sup>th</sup> in the world and 5<sup>th</sup> in Nepal among all types of cancer as of 2018. This is a hospital-based retrospective study. Required details of 128 patients who underwent surgery from 1<sup>st</sup> April 2018 to 30<sup>th</sup> October 2019 in Nepal Cancer Hospital and Research Center, Lalitpur. Data were collected age-wise, sex-wise, site-wise, and stage-wise prevalence was figured out. The data were analyzed using MS excel 2007. It was found that males were more commonly affected than females with the mean age for males at diagnosis being 53.3 years and females being 55.62 years. The tongue was the most affected site followed by GBS then buccal mucosa and RMT. Most people knew about cancer growing on them only at advanced stages.

**Keywords:** Oral cancer, tobacco

### INTRODUCTION

Oral cancer includes cases of lips, gingival, tongue, oropharynx, sinuses. About 96% of cases of oral cancer are squamous cell carcinoma (Siddiqui *et al.*, 2012). The subtypes here refer to some variations of SCC. Some common variants are Verrucous carcinoma and Basaloid cell carcinoma, while other rare variants are Spindle cell carcinoma, Papillary squamous cell carcinoma and Adeno-squamous carcinoma (Chovatiya *et al.*, 2018). Moreover, the rest of the cases are Adenocarcinoma which are related to dysplasia of glandular cell of the salivary gland.

Studies have reported several types of risk factors for oral cancer as tobacco consumption and alcohol consumption. The risk of disease gradually decreases as time passes after the cessation of smoking. The relative risk among current smokers (The industrial brand cigarettes), Ex-smokers (1-10 Years), and Ex-smokers (>10 Years) are 9.3, 2.9 and 0.6, respectively (Franco *et al.*, 1989). In the comparison with non-alcohol drink, a consumption of <6 drinks/day of alcohol has no link with an increased risk of oral cancer; however, the odd ratio was 3.69 for 6-10 drinks/day and 4.94 for  $\geq 10$  drinks/day (Rodriguez *et al.*, 2004).

People at higher risk of developing oral cancer are those who use both alcohol and tobacco; this is due to combined effects of dehydrating effect of alcohol on cell membranes which enhances the ability of tobacco-associated carcinogens to get absorbed the mouth tissues (Ogden, 2005). The OR was 8.29 for moderate drinkers heavy smokers and 15.66 for non-smokers heavy drinkers, compared with non-smokers (including never and ex-smokers combined) and moderate drinkers. It is found the

OR for heavy smokers and heavy alcohol drinkers increased over 48 times (Rodriguez *et al.*, 2004).

Sometimes a viral infection may also cause cancer to develop. Viruses like Human Papilloma Virus and Estein Barr Virus are often seen as oncogenic viruses for the oral cavity. In a study (Maden *et al.*, 1992), it has been shown that men with an oral HPV-6 infection had 2.9 times the risk for oral cancer non-infected men.

Surgery is mostly carried out to remove cancerous tissues of the oral cavity. Chemo- and radiotherapy are also carried out after or along with surgery. Overall, the one-year survival rate for patients with all stages of oral cavity 81%, while the five-year survival is 56% and ten-year survival rate 41% (WebMD, 2017). Similarly, Neville and Day (2009) state that 5 yr relative survival rates for oral and oropharyngeal cancer in localized carcinoma, regional spread and distant metastasis conditions are 82.3%, 48.4%, and 21.4%, respectively. TNM stage also affects survival. It would be better to prevent cancer at first hand, for which we have to be away from the cancer-causing risk factors. At least 3/4<sup>th</sup> of oral cancers could be prevented by eliminating tobacco, smoking and reduction in alcohol consumption (Warnakulasuriya, 2009). Moreover, according to the American Cancer Society, a cancer-related check-up annually for all individuals aged 40 and older & every three years for those between the ages of 20 and 39 could be beneficial (Neville & Day, 2009).

With an annual estimated incidence of around 275000, oral and pharyngeal cancer grouped together is the sixth most common cancer in the world, (Warnakulasuriya, 2009). The age-standardized incidence rate of lip/oral cavity in

the whole world is 5.8 per 100000 male and 2.3 per 100000 per female (GLOBOCON, 2018). In Nepal, lip and oral cancer is fifth common cancer (NHRC, 2018).

Southeast Asia (Sri Lanka, India, Pakistan, and Taiwan), Parts of western (France) and eastern Europe (Hungary), parts of Latin America and the Caribbean (Brazil, Uruguay, and Puerto Rico) and in Pacific regions (Papua New Guinea) are areas characterized by high incidence rates for oral cancer (Excluding lip) (Warnakulasuriya, 2009).

For now, the immediate need is to know how cancer is spreading in our country. What is its prevalence? What is its trend of occurrence? Who is at higher risk? How are we vulnerable to this disease? Thus, it is quite sure that this will eventually help the authorities to make plans and policies so that frequency of oral cancer could be minimized in the future.

## MATERIALS AND METHODS

### Study Area

This study is based on patients diagnosed at NCHRC (Nepal Cancer Hospital and Research Center), located in Harisiddhi, Lalitpur, Nepal. It is a private hospital that occupies about 24 *Ropanis* of land, 150 bedded hospitals, all modern surgery equipment, Radiotherapy facilities, Chemotherapy, Targeted Chemotherapy, Immunotherapy, Molecular lab, Research Oriented center.

### Data Collection

The Head and Neck Oncology department made the register files available, which accounted for the details of

each patient for the study. Details included name, age, sex, diagnosis, site of cancer, date of operation, radiotherapy, chemotherapy received or not details of patients were recovered.

This study includes 128 patients diagnosed between 1<sup>st</sup> April 2018 to 30<sup>th</sup> October 2019 with different oral malignancies and stages that have been taken as samples. This study includes only those cases whose surgery was performed.

All the patients having the following malignancies have been included in this study: Malignant neoplasm of lip, tongue, gum, floor of the mouth, palate, other unspecified parts of the mouth. The work has been approved by the hospital.

### Data Analysis

Chi-Square test (Test for Goodness of fit and association) was performed to check for uniformity of case distribution. The analysis was done in MS Excel 2016 and represented in pie charts, bar diagrams and tables.

## RESULTS

Of a total of 128 patients, 32.03% were tongue cancer, 19.53% Gingivobuccal sulcus (GBS) 14.84% buccal mucosa cancer, 10.16% Retromolar trigone (RMT) cancer, 9.38% mandibular alveolus cancer, 7.03% maxillary alveolus cancer, 3.91% soft palate cancer, 1.56% of mouth and 1.50% had cancer in the lip (Fig. 1). The number of male cases (96) was higher than females (32) (Fig. 2).

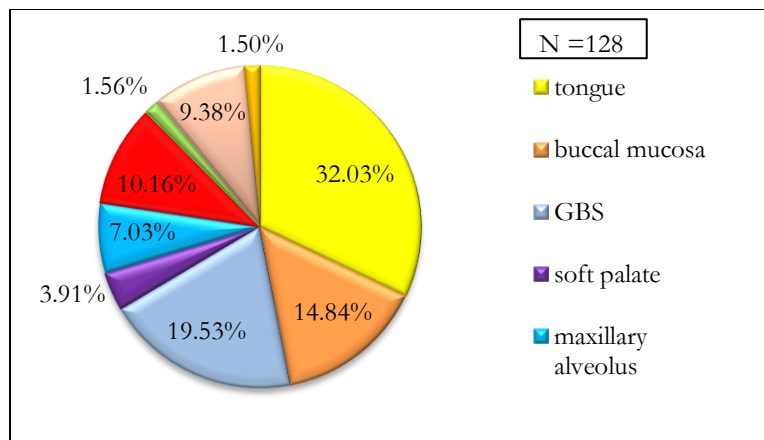
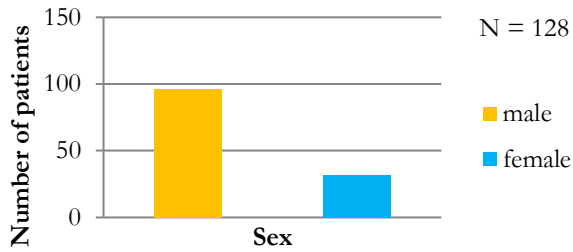


Figure 1. Distribution of oral cancer cases among different sites of oral cavity and lip



**Figure 2. Distribution of oral cancer cases among male and female**

The tongue was the most common site in males (23.44%) and females (8.59%). In males, it was followed by GBS (14.06%), buccal mucosa (11.72%), RMT (7.81%), mandibular alveolus (7.03%), maxillary alveolus (6.25%), soft palate (2.34%) and lastly, lip (1.56%).

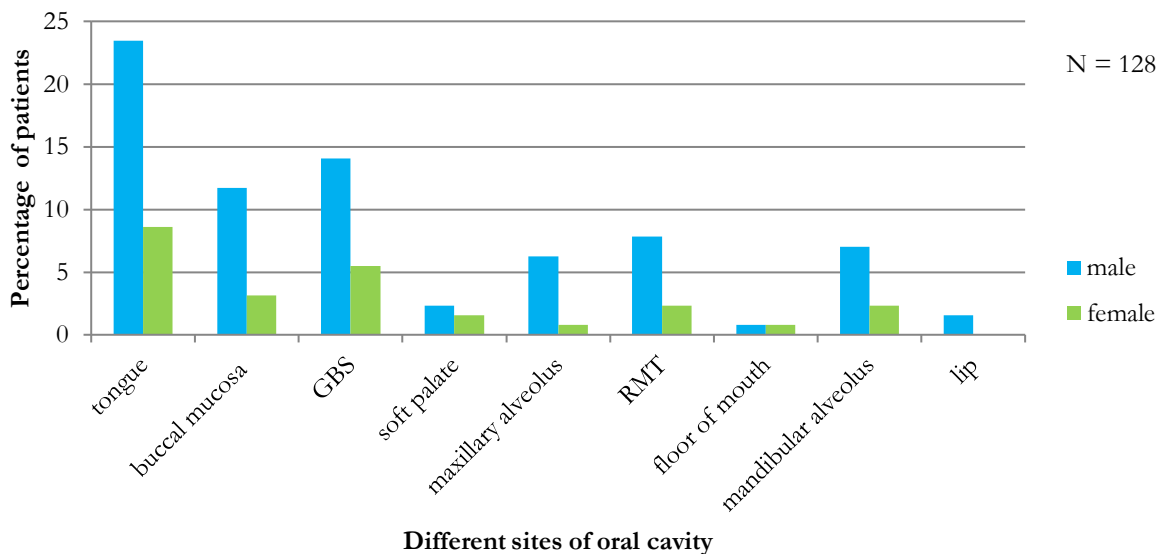
In females, tongue is followed by GBS (5.47%), buccal mucosa (3.125%), RMT (2.34%), mandibular alveolus (2.34%), soft palate (1.56%), maxillary alveolus and floor of mouth with equal cases, i.e., 0.78% for each case. Not a single case of the lip was found in females (Fig. 3). There was a significant difference in site-wise cancer case distribution in males and females ( $p < 0.05$ ). Likewise, neither the distribution of cases in males nor in females was uniform among different sites of the oral cavity ( $p < 0.05$ ). Also, there was a significant difference in the distribution of cases among different age groups ( $p < 0.05$ ). More than half of patients (57.81%) were having age above 50 Years, 24.22% of patients were within 41-50 Years, 14.06% were

within 31-40%, 3.12% were within 20-30%, and only a single case (0.78%) was below 20 Years (Fig. 4).

There was a significant difference in age-wise case distribution in males and females ( $p < 0.05$ ). In a male, it was found that 41.41% of total patients had age above 50 Years, 19.53% were within 41-50 Years, 10.94% were within 31-40 Years, 2.34% within 20-30% and single case (0.78%) below 20 Years.

In females, 16.41% of total patients had age above 50 Years, 4.69% were within 41-50 Years, 3.12% were within 31-40 Years, single case (0.78%) within 20-30 Years and not even a single case below 20 Years (Fig. 5). It was found that squamous cell carcinoma (SCC) was present in 98.44% of total patients, while only 1.56% of patients were found to have verrucous carcinoma (VC) (Fig. 6). Of 128 patients, 1.56% were diagnosed at stage I, 35.94% at stage II, 24.22% at stage III and 38.28% at stage IV (Fig. 7).

Table 1 shows the site-wise distribution of cases in different age groups. Except for GBS, the maximum number of cases was for the age group above 50 years. For GBS, the case frequency was equal (11) for both age groups, 41-50 and >50 years. In both sexes for the tongue, patients over 50 years were in higher frequency (in males 34.15% of total tongue patients and in females 21.95% of total tongue patients). Similarly, patients of GBS having age more than 50 years and within 41-50 years were in higher frequency in both sexes (in male 32% of 25 in each age group and female 12% of 25 in each group).



**Figure 3. Site-wise distribution of oral cancer cases in male and female**

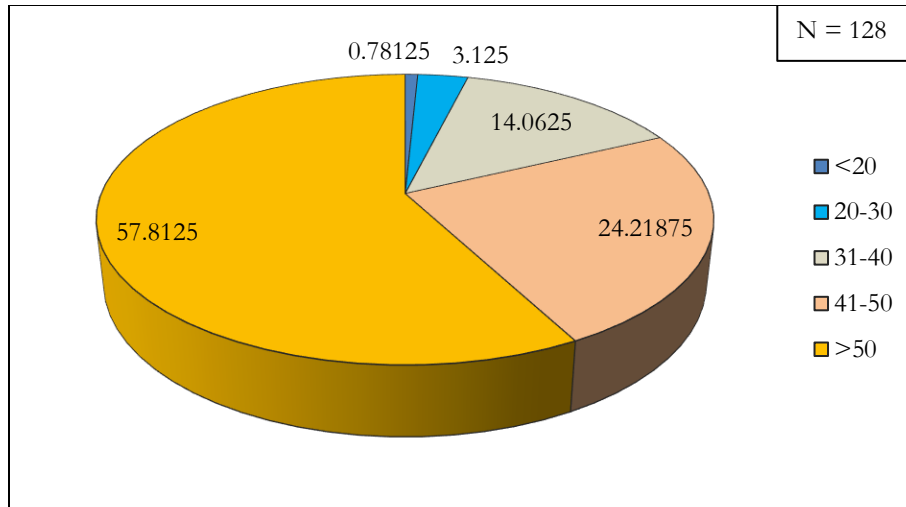


Figure 4. Distribution of oral cancer cases among different age groups

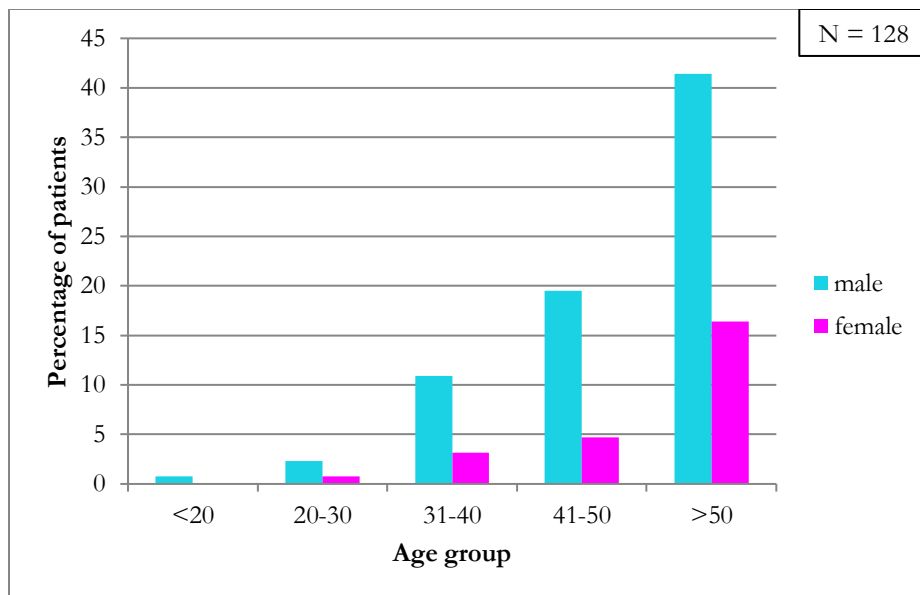


Figure 5. Age-wise distribution of oral cancer cases in male and female

## DISCUSSION

Studies have reported that higher incidence of mouth cancer in males compared with females. A study from China by Zhang *et al.* (2011) reported that higher incidence of males' mouth cancer compared with females was in the ratio of 2.2:1. In global extent, Warnakulasuriya (2009) had shown the ratio of male to female was about 1.5:1 for mouth cancer. In another study, Zhang *et al.* (2011) showed the ratio to be 1.97:1 while Sugerman and Savage (2002) showed it was 2.2:1. This study also found males more vulnerable to oral cancer, showing the male to female ratio to be 3:1.

The finding of our study is similar to a previous study conducted by Poudel *et al.* in 2017. Similarly, while talking about site-wise prevalence, a study in Allahabad, India by (Mehrotra *et al.*, 2008) had shown tongue as the most common site (37.8%). While (Byakodi *et al.*, 2011) showed alveolus as the most common site (32.14%) In Nepal, a hospital-based study (Poudel *et al.*, 2017) showed tongue as the most common site (32.03%).

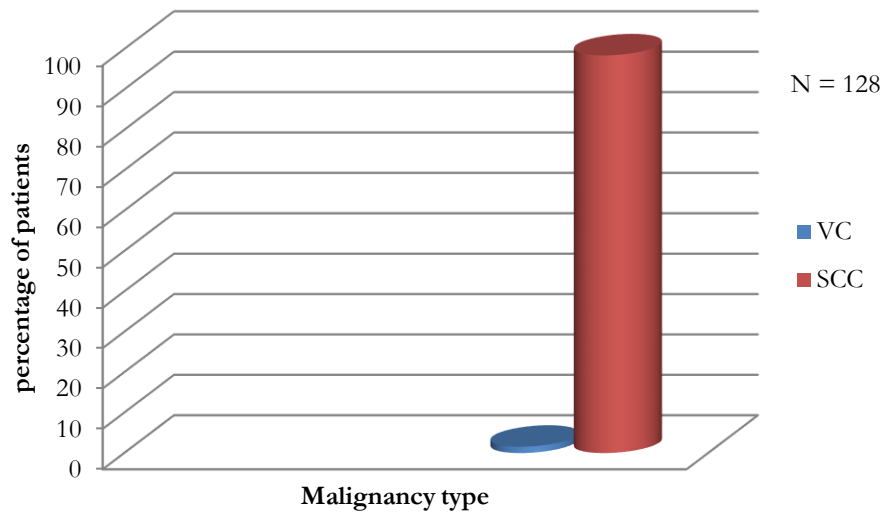


Figure 6. Distribution of cancer cases in VC and SCC type of malignancy

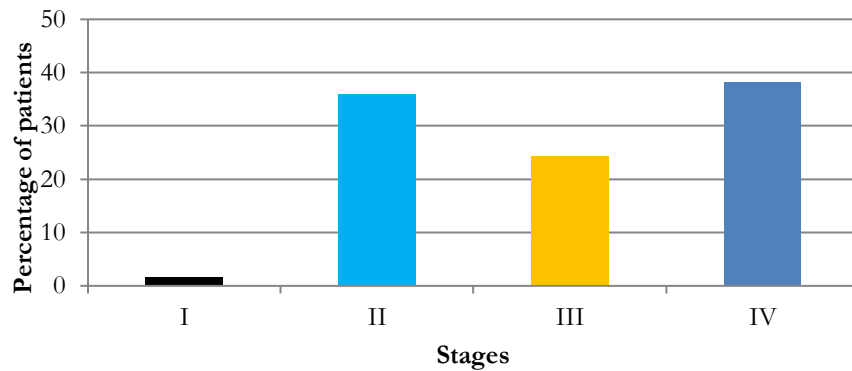


Figure 7. Distribution of cancer cases among stage I, II, III and IV

Table 1. Site-wise distribution of cases in different age groups

Site	Different age groups					Total
	<20	21-30	31-40	41-50	>50	
Tongue (C01+C02)	0	2	8	8	23	41
GBS (C03.9)	0	0	3	11	11	25
Buccal mucosa (C06.0)	0	0	4	3	12	19
RMT (C06.2)	0	1	3	4	5	13
Mandibular alveolus (C03.0)	0	0	0	1	11	12
Maxillary alveolus (C03.1)	0	1	0	3	5	9
Soft palate (C05.1)	1	0	0	1	3	5
Floor of mouth (C04)	0	0	0	0	2	2
Upper lip (C00.0)	0	0	0	0	2	2
<b>Total</b>	<b>1</b>	<b>4</b>	<b>18</b>	<b>31</b>	<b>74</b>	<b>128</b>

\*Figures inside parenthesis denotes the classification code for corresponding site † GBS= Gingivobuccal sulcus, RMT= Retromolar trigone

Tandon *et al.* (2017) showed that the most affected (39.5%) age group was above 50 Years, while the least affected (0.19%) age group was below 20 Years. The same study also showed that males in all anatomical sites were predominantly affected. Moreover, males over 50 Years

were mostly affected among the whole sample studied. In this study, the most affected ( 57.81%) age group was above 50 Years, and the least affected (0.78%) age group was below 20 Years. Males were most affected in all sites except for the floor of the mouth, where both males and

females were equally affected. Above all, males over 50 Years were mostly affected among the whole sample.

Phillips (1987) have reported several reasons for higher incidence of oral cancer compared with younger age. It is because the older the age, the tendency of a gene to mutate also increases. We can also reason that even if a person has been exposed to the risk factors at his/her earlier age, it takes significant time to start the genetic change by carcinogens. There lies 25 Years latency between the initial exposure to a carcinogen and the development of cancer.

A study in Mexico by (Luis *et al.*, 2011) showed that the females suffering from oral squamous cell carcinoma (OSCC) had mean age at diagnosis of 58.4 Years, while in the male, it was 52 Years. In this study, the mean age of males at diagnosis was 53.3 years, and in the female, it was 55.62 Years. Vatanasapt *et al.* (2011) showed that the mean age of whole patients at diagnosis was 63 years, and 85% were diagnosed at stage III and IV collectively in Thailand. In this study, the mean age of whole patients at diagnosis was 53.88 Years. Furthermore, 62.5% were found to be diagnosed at Stage III and IV collectively.

In Eastern Nepal (Rimal *et al.*, 2019) showed SCC accounted for the majority (86.67%) of cases while only 13.33% for VC. This study showed SCC to be 98.44% and VC 1.56%. Another study in Nepal by (Srii *et al.*, 2017) showed male patients had an age range of 53-83 Years while females had 55-72 Years. In this study, the age range for male patients was 18 to 82 years, while for females, it was 30 to 88 years. A comprehensive study by Shrestha *et al.* (2019) reported higher overall prevalence in males (52.3%) than in females (8.4%) in 2019. Not just changed lifestyles and food habits of people, the lack of proper health facilities across the country are also the risk factors for oral cancer. The reason for higher incidence of oral cancer in Nepal may be due to inadequate dentist, poverty, lack of awareness, easy availability of tobacco products, oncologist, surgeons, a smaller number of cancer center. Management of cancer in the long run is costly and difficult for poor people to afford it which makes it more difficult to deal with.

## CONCLUSIONS

Males were three times more commonly affected than females. The tongue was found to be the most affected site, followed by GBS, buccal mucosa, RMT, mandibular alveolus, maxillary alveolus, soft palate, the floor of the mouth, and lip. People above 50 years were most affected, while below 20 years were least commonly affected. On average, males were found to be affected earlier than females. Most people knew about cancer growing on them only at advanced stages. This shows that regular health check-ups were lacking among people. Also, proper plans and policies should discourage the import, production, and consumption of tobacco and related products.

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## AUTHOR CONTRIBUTIONS

KT designed the research, collected the data, analyzed, and wrote the manuscript. PJ designed the research, proofread, and edited the manuscript.

## CONFLICT OF INTERESTS

The authors declare no conflict of interests.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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