



# Incidence of Oral Squamous Cell Carcinoma amongst the people of Surat

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## ABSTRACT

The present study was carried out to evaluate the prevalence of oral cancer among the people of Surat, Gujarat, India.

All the subjects were priorly informed about the same and their identities were kept undisclosed while collecting the data. The data of 213 subjects was collected from Bharat Cancer and Research Institute of Surat.

The results obtained showed high prevalence of oral cancer among the people of Surat, Gujarat, India with the number being higher in males as compared to females. The results obtained were assessed in both numbers and percentages.

The results state that there is a high requirement to create awareness about the pre-disposing factors associated with its occurrence like smoking and smokeless tobacco, alcohol consumption, etc. and various harmful effects associated with the same to make our country a better and healthier place to live.

Key words

Oral Cancer, Surat, Gujarat, India, Gender based prevalence of Oral Cancer awareness, Anterior 2/3<sup>rd</sup> off tongue, Anterior gingival sulcus, Buccal Mucosa, Dorsal tongue, Floor of mouth, Gingivobuccal sulcus, Left-angle of mouth, Leftbuccal mucosa, Left gingivobuccal sulcus, Left lateral border, Left lateral tongue, Left lower alveolus, Left retromolar triangle, Lower alveolus, Lower anterior gingiva, Lower alveolus, Lower lip, Retromolar triangle, Right angle of mouth.

## I. INTRODUCTION

Oral cancer is one of the 10 most common cancer in the world. (Rivera C. , 2015) It has an increased rate of occurrence in today's world due modernization directly or indirectly affecting the human health. In comparison with the U.S.

population, where oral cavity cancer represents only about 3% of malignancies, it accounts for over 30% of all cancers in India. The variation in incidence and pattern of oral cancer is due to regional differences in the prevalence of risk factors. (Coelho, 2012)

When it comes to oral cancer there are specific pre-dispositions associated with it such as – smoking and smokeless tobacco, alcohol, viral infections like those associated with Human Papilloma Virus, poor nutrition, UV light, genetic syndromes like – Fanconi anemia and Dyskeratosis congenita and unproven factors like – mouthwash, irritation from dentures and poor oral health (American Cancer Society, n.d.). However, even the lack in number of diagnostic aids and man-power available also contributes to in the numbers of oral cancer.

## Definition

According to National Cancer Institute - Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. (Institute, <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>, n.d.).

## Epidemiology

Oral cancer is two to three times more prevalent in men than women and slightly more in whites than in blacks (American Cancer Society, n.d.). As per the worldwide reports, oral cancer and cancer of pharynx together represent sixth most common cancer in the world. (Saman Warnakulasuriya, April–May 2009).

Oral cavity and oropharyngeal cancers occur most often in the following sites:

The tongue

The tonsils and oropharynx

The gums, floor of the mouth, and other parts of the mouth



The rest are found in the lips, the minor salivary glands (which often occur in the roof of the mouth), and other sites.

The average age of most people diagnosed with these cancers is 63, but they can occur in young people. Just over 20% (1 in 5) of cases occur in patients younger than 55.

Overall, the lifetime risk of developing oral cavity and oropharyngeal cancer is: about 1 in 60 (1.7%) for men and 1 in 140 (0.71%) for women. (American Cancer Society, n.d.)

#### Methods

##### Ethical clearance

A total of 213 subject's data was collected using convenience sampling technique without disclosing their identity from the Bharat Cancer and Research Institute after completing all the ethical legalities.

##### Study sample and sampling technique

A total of 213 subject's data was included for the present study.

All the data was obtained through the Bharat Cancer and Research Institute of 213 subjects out of the total population of 60,81,322 of Surat, Gujarat, India as per the 2011 census data. (<https://surat.nic.in>, 2022). An age group between 32-40 was selected for the research.

The sample size was selected based on the single proportion formula

$$n = \frac{z^2 p(p-1)}{d^2}$$

based upon the confidence interval of (CI) of 95% and margin of error(d) of 4%.

#### Results

##### Tumor Site

Based upon the results obtained following tumor sites were seen for oral cancer-

- Anterior 2/3<sup>rd</sup> of tongue
- Anterior gingival sulcus
- Buccal mucosa
- Dorsal tongue
- Floor of the mouth
- Gingivobuccal sulcus
- Left angle of mouth
- Left buccal mucosa
- Left gingivobuccal sulcus
- Left lateral border
- Left lateral tongue
- Left lower alveolus
- Left retromolar triangle
- Lower alveolus
- Lower anterior gingiva
- Lower aveolus
- Lower lip
- Retromolar triangle
- Right angle of mouth

- Right buccal mucosa
- Right dorsal tongue
- Right lateral tongue
- Right lower alveolus
- Right retromolar triangle area
- Right tongue
- Right upper alveolus
- Soft palate
- Tongue
- Upper alveolus
- Ventral tongue

From the mentioned sites, in females left buccal mucosa and left lateral tongue involvement was seen the most of 20% each out of all the other sites and males right buccal mucosa involvement was seen maximum with 17.49%.

For rest of the sites, in females for left angle of mouth it was 3.33%, for left gingivobuccal sulcus 3.33%, left lower alveolus 3.33%, lower alveolus 3.33%, right buccal mucosa 13.33%, right lateral tongue 16.67%, right tongue 3.33% and right upper alveolus 13.33%.

In case of males, it was 2.19% for anterior 2/3<sup>rd</sup> tongue, 0.55% for anterior gingival sulcus, 4.92% for buccal mucosa, 2.73% for dorsal tongue, 0.55% for floor of mouth, 0.55% for gingivobuccal sulcus, 16.94% for left buccal mucosa, 1.64% for left gingivobuccal sulcus, 0.55% for left lateral border, 9.84% for left lateral tongue, 1.09% for left lower alveolus, 0.55% for left retromolar triangle, 6.01% for lower alveolus, 0.55% for lower anterior gingiva, 1.09% for lower alveolus, 4.37% for lower lip, 0.55% for retromolar triangle, 3.28% for right angle of mouth, 0.55% for right dorsal tongue, 15.85% for right lateral tongue, 1.64% for right lower alveolus 2.19% for right retromolar triangle, 2.19% for soft palate, 1.09% for tongue, 0.55% for upper alveolus and 0.55% for ventral tongue.

##### Lymphocytic Infiltration

The results obtained showed that, maximum was dense infiltration that is 60% for females and 50.82% for males.

Remaining for females 6.67% was moderate infiltration, 3.33% infiltration was seen and for remaining 3.33% infiltration was unable to be determined. For males, 0.55% showed mild infiltration, 1.09% moderate, 39.34% no infiltration, 0.55% scanty infiltration, in 2.19% infiltration was seen and for 5.46% infiltration could not be determined.



#### Lympho-vascular Emboli

The results obtained showed that, in females 53.33% showed lympho-vascular invasion and 46.67% it was absent and in males, 49.18% showed, 48.09% did not and for remaining 2.73% invasion could not be determined.

#### Perineural Invasion

The results showed that, maximum of females and males that is 83.33% and 65.03% respectively invasion was not seen and in 13.33% and 30.05% females and males it was not seen. For 3.33% females and 4.92% males it could not be determined.

#### Lymphocytic Infiltration versus Lympho-vascular Emboli

From the above-mentioned data, those who showed lymphocytic infiltration also showed lympho-vascular emboli both for females and males.

#### Lymphocytic Infiltration versus Perineural Invasion

Those who showed lymphocytic infiltration it was seen that maximum of them did not show perineural invasion.

#### Lympho-vascular Emboli versus Perineural Invasion

From the results obtained, it was seen that maximum of them who showed lympho-vascular-invasion did not show perineural invasion for both females and males.

#### Limitations

For certain cases, in case of lymphocytic infiltration, lympho-vascular invasion and perineural invasion the outcome could not be determined. Also, majority of patients that were examined unintentionally were males and the number was less for females.

## II. DISCUSSION

In the above done study it was seen that oral cancer prevalence on floor of the mouth was only 0.55% in males with no prevalence in females in India and similar results were obtained from the study done from 2007-2016 in United States (Taylor D. Ellington, 2020).

From the results obtained by the study of Oral Cancer statistics in India on the basis of first report of 29 population-based cancer registries, north region was at the highest risk of developing tongue cancer (58.4%) in the 60- to 69-year age group among males followed by northeast regions (37.2%) in the 70- to 75-year age group, whereas in this study the percentages were 20% for left lateral tongue, 2.73% for dorsal tongue, 9.84% for left lateral tongue, 0.55% for right dorsal tongue, 15.85% for right lateral tongue, 1.09% for tongue which states that the percentages for tongue occurrence in western India are less as compared to north or north-east India. Females showed a different pattern with maximum AAR in the south region (18.5%)

followed by the north region (15.4%) in the 60-year age group and in this study, it was 20% for left lateral tongue, 16.67% for right lateral tongue and 3.33% for right tongue which proves that the percentages for females were slightly higher in western India as compared to southern and northern India. (Swati Sharma, 2018).

Highest AAR (37.1%) was observed among males in the northeast region in the 70-year age group followed by AAR (12.3%) in west regions in 70- to 75-year age group. Females showed maximum AAR in the northeast regions followed by the north regions (37%) in the 70- to 75-year age group whereas here it was only 4.37% for lower lip in males with no female involving the same. This states that for lip cancer involvement is negligible in western India as compared to northeast regions in males and in females (Swati Sharma, 2018). This contradicts our result obtained which showed significant prevalence of oral cancer in western India that is in Surat.

Even, the high incidence of lack of oral hygiene awareness can also contribute to Oral Cancer occurrence as the percentages for both are high in case of Valsad. (Thakor P. J., 2021).

From gender perspective oral cancer prevalence through this study is clearly more in males than females and same results are supported by the oral cancer facts related to occurrence of it in US that is for decades oral cancer has affected 6 men for every woman. That ratio has now become 2 men to each woman in anterior of the mouth disease. (Oral Cancer Facts)

## III. CONCLUSION

From the above - mentioned study, it becomes very clear that the prevalence of oral cancer is quite high in Surat mainly in males as compared to females and similar case can be considered for the places similar to Surat in India.

Surat being a metro city raises even more of a concern about the same considering the good level of education over there.

So, even though there are various awareness programs available for oral cancer still the data obtained makes it utmost important to spread even more awareness through the means of advertisements, radio messages, public discussions, special awareness camps, etc. Even dentists can educate the patients coming to them if they are associated with any predisposing factors for the same as they are the ones directly associated with the oral cavity and its associated problems.

Hence, by doing so we can make our country a better and healthier place to live in.



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Appendix

Tumor Site	Female	% Of Female	Male	% Of Male	Total	Total %
Ant 2/3rd tongue		0.00%	4	2.19%	4	1.88%
Anterior gingival sulcus		0.00%	1	0.55%	1	0.47%
Buccal mucosa		0.00%	9	4.92%	9	4.23%
Dorsal tongue		0.00%	5	2.73%	5	2.35%
Floor of mouth		0.00%	1	0.55%	1	0.47%
Gingivobuccal sulcus		0.00%	1	0.55%	1	0.47%
Left angle of mouth	1	3.33%		0.00%	1	0.47%
Left buccal mucosa	6	20.00%	31	16.94%	37	17.37%
Left gingivobuccal sulcus	1	3.33%	3	1.64%	4	1.88%
Left lateral border		0.00%	1	0.55%	1	0.47%
Left lateral tongue	6	20.00%	18	9.84%	24	11.27%
Left lower alveolus	1	3.33%	2	1.09%	3	1.41%
Left retromolar triangle		0.00%	1	0.55%	1	0.47%
Lower alveolus	1	3.33%	11	6.01%	12	5.63%
Lower anterior gingiva		0.00%	1	0.55%	1	0.47%
Lower aveolus		0.00%	2	1.09%	2	0.94%
Lower lip		0.00%	8	4.37%	8	3.76%
Retromolar triangle		0.00%	1	0.55%	1	0.47%
Right angle of mouth		0.00%	6	3.28%	6	2.82%



Right buccal mucosa	4	13.33%	32	17.49%	36	16.90%
Right dorsal tongue		0.00%	1	0.55%	1	0.47%
Right lateral tongue	5	16.67%	29	15.85%	34	15.96%
Right lower aveolus		0.00%	3	1.64%	3	1.41%
Right retromolar triangle		0.00%	4	2.19%	4	1.88%
Right tongue	1	3.33%		0.00%	1	0.47%
Right upper alveolus	4	13.33%		0.00%	4	1.88%
Soft palate		0.00%	4	2.19%	4	1.88%
Tongue		0.00%	2	1.09%	2	0.94%
Upper alveolus		0.00%	1	0.55%	1	0.47%
Ventral tongue		0.00%	1	0.55%	1	0.47%
Total	30	100.00%	183	100.00%	213	100.00%

#### Lymphocytic Infiltration

	Female	% Of Female	Male	% Of Male	Total	Total %
dense	18	60.00%	93	50.82%	111	52.11%
mild			1	0.55%	1	0.47%
moderate	2	6.67%	2	1.09%	4	1.88%
no	8		72	39.34%	80	37.56%
scanty			1	0.55%	1	0.47%
yes	1	3.33%	4	2.19%	5	2.35%
(blank)	1	3.33%	10	5.46%	11	5.16%
Total	30	100.00%	183	100.00%	213	100.00%

#### Lymphovascular Emboli

	Female	% Of Female	Male	% Of Male	Total	Total %
No	14	46.67%	88	48.09%	102	47.89%
Yes	16	53.33%	90	49.18%	106	49.77%
Blank			5	2.73%	5	2.35%
Total	30	100.00%	183	100.00%	213	100.00%

#### Perineural Invasion

	Female	% Of Female	Male	% Of Male	Total	Total %
No	25	83.33%	119	65.03%	144	
Yes	4	13.33%	55	30.05%	59	0.6
Blank	1	3.33%	9	4.92%	10	4.69%
Total	30	100.00%	183	100.00%	213	100.00%

