



**ORAL CANCER**

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**ABSTRACT**

Oral cancers often occurs out of long standing potentially malignant lesions and conditions so called premalignant lesions and conditions. Oral precancer is a intermediate state with increased cancer rate which can be recognized and treated obviously with much better prognosis than a full blown malignancy. Oral cancer risk can be lowered or even prevented by simply understanding basic oral hygiene, different bacteria found in the mouth, and how diet influences oral cancers. Currently, research is being done on the relationship between diet and oral cancer. Oral cancer is a very serious disease that can be prevented. Practicing good oral hygiene is key to help keep the oral cavity clean. Limiting the use of tobacco and alcohol products is also important because these are the causes of most oral cancers. Lastly, eating a well balanced diet that has protective affects can reduce the risk of oral cancer. This includes a diet high in fruits, vegetables, and fish and low in high fat and cholesterol meats, rice, and refined grains.

**KEYWORDS:** *Dentist, oral cancer, smoking, tobacco.*

**INTRODUCTION**

The study of the oral cavity is important to identify the pathologies associated with it.<sup>[1]</sup> Tumor in Latin means *lump*.<sup>[2]</sup> The tumor or neoplasm serves no useful purpose. Fundamental to its origin, there is loss of responsiveness to the normal growth control. Epidemiological studies have shown that in the United States, over 500,000 deaths are caused every year because of malignant neoplasms. India, which occupies 2.4% of the world's land mass, accommodating about 16.5% of the world population, is estimated to have 6 million cancer patients at any point of time and nearly 2 million new cases every year, which is a major cause of death.<sup>[3]</sup> Even more anguishing than the mortality is the physical and the emotional trauma caused by these neoplasms. Controlling this dreadful surge is based on learning more about the origin and vulnerabilities of neoplasms. It has led to a great progress in this field.<sup>[4]</sup>

The ninth version of the international classification of diseases by the World Health Organization (WHO) classifies oral cancer under lip, tongue, gingiva, floor of the mouth, and other parts of mouth.<sup>[5,6]</sup>

It was Christopher Columbus who first found tobacco in San Salvador. He saw that these strange leaves were traded and used for ceremonial and medicinal purposes. They were powdered and inhaled by native Indians in a "Y" shaped piece of cone or pipe. These strange leaves

later came to be known as tobacco. Tobacco was introduced to India in the late 16<sup>th</sup> and early 17<sup>th</sup> century. Here, tobacco smoking became a symbol of aristocracy with the introduction of hooka.

Tobacco belongs to the potato family genus *Nicotiana*. Linnaeus named it in 1753 after French ambassador John Nicot. It is chewed, smoked, sniffed, or sucked. The carcinogenic role of tobacco varies depending upon the tobacco product, the way in which it is used, and its combination with other substances.

In India, tobacco is used in various ways that include smoked tobacco and smokeless tobacco which is used for chewing. These substances are either used alone or in unison with other products also. A large percentage of populations have uses both smoked and smokeless tobacco together.<sup>[7,8]</sup>

In a study conducted by Vora *et al.* about alcohol, tobacco, and paan use and its relation to oral cancer threat among Asian males in Leicester, it was found that 7% of first-generation Hindu males chewed paan containing tobacco that is strongly associated with oral cancer.<sup>[9]</sup>

**Signs and symptoms**

In its early stages, it can go unnoticed. It can be painless with slight physical changes. But the precursor tissue

changes, can be noticed by the doctors. Early stage symptoms can include persistent red or white patches, a non-healing ulcer, progressive swelling or enlargement, unusual surface changes, sudden tooth mobility without apparent cause, unusual oral bleeding or epistaxis and prolonged hoarseness.<sup>[10]</sup> Late stage symptoms can

include an indurated area, paresthesia or dysesthesia of the tongue or lips, airway obstruction, chronic serous otitis media, otalgia, trismus, dysphagia, cervical lymphadenopathy, persistent pain or referred pain and altered vision.<sup>[10]</sup>

### What Are the Symptoms of Oral Cancer?<sup>[11]</sup>

The most common symptoms of oral cancer include:

- Swellings/thickenings, lumps or bumps, rough spots/crusts/or eroded areas on the lips, gums, or other areas inside the mouth
- The development of velvety white, red, or speckled (white and red) patches in the mouth
- Unexplained bleeding in the mouth
- Unexplained numbness, loss of feeling, or pain/tenderness in any area of the face, mouth, or neck
- Persistent sores on the face, neck, or mouth that bleed easily and do not heal within 2 weeks
- A soreness or feeling that something is caught in the back of the throat
- Difficulty chewing or swallowing, speaking, or moving the jaw or tongue
- Hoarseness, chronic sore throat, or change in voice
- Ear pain
- A change in the way your teeth or dentures fit together
- Dramatic weight loss



### Causes

Mouth cancer occurs when cells on your lips or in your mouth develop changes (mutations) in their DNA. These mutations allow cancer cells to continue growing and dividing when healthy cells would die. The accumulating abnormal mouth cancer cells can form a tumor. With time they may spread inside the mouth and on to other areas of the head and neck or other parts of the body. Mouth cancers most commonly begin in the flat, thin cells (squamous cells) that line your lips and the inside of your mouth. Most oral cancers are squamous cell carcinomas. It's not clear what causes the mutations in squamous cells that lead to mouth cancer. But doctors have identified factors that may increase the risk of mouth cancer.<sup>[12]</sup>

### Risk factors

Factors that can increase your risk of mouth cancer include:

1. Tobacco use of any kind, including cigarettes, cigars, pipes, chewing tobacco and snuff, among others
2. Heavy alcohol use
3. Excessive sun exposure to your lips
4. A sexually transmitted virus called human papillomavirus (HPV)
5. A weakened immune system

### Tobacco

In a study of Europeans, smoking and other tobacco use was associated with about 75 percent of oral cancer cases,<sup>[13]</sup> caused by irritation of the mucous membranes

of the mouth from smoke and heat of cigarettes, cigars, and pipes. Tobacco contains over 60 known carcinogens, and the combustion of it, and by-products from this process, is the primary mode of involvement. Use of chewing tobacco or snuff causes irritation from direct contact with the mucous membranes.

Tobacco use in any form by itself, and even more so in combination with heavy alcohol consumption, continues to be an important risk factor for oral cancer. However, due to the current trends in the spread of HPV16, as of early 2011 the virus is now considered the primary causative factor in 63% of newly diagnosed patients.

### Alcohol

Some studies in Australia, Brazil and Germany pointed to alcohol-containing mouthwashes as also being potential causes. The claim was that constant exposure to these alcohol-containing rinses, even in the absence of smoking and drinking, leads to significant increases in the development of oral cancer. However, studies conducted in 1985,<sup>[14]</sup> 1995,<sup>[15]</sup> and 2003<sup>[16]</sup> summarize that alcohol-containing mouth rinses are not associated with oral cancer. In a March 2009 brief, the American Dental Association said "the available evidence does not support a connection between oral cancer and alcohol-containing mouthrinse".<sup>[17]</sup> A 2008 study suggests that acetaldehyde (a breakdown product of alcohol) is implicated in oral cancer,<sup>[18][19]</sup> but this study specifically focused on abusers of alcohol and made no reference to mouthwash. Any connection between oral cancer and mouthwash is tenuous without further investigation.

**Stem cell transplantation**

Patients after hematopoietic stem cell transplantation (HSCT) are at a higher risk for oral squamous cell carcinoma. Post-HSCT oral cancer may have more aggressive behavior with poorer prognosis, when compared to oral cancer in non-HSCT patients.<sup>[20]</sup> This effect is supposed to be owing to the continuous lifelong immune suppression and chronic oral graft-versus-host disease.<sup>[20]</sup>

**Prevention**

There's no proven way to prevent mouth cancer. However, you can reduce your risk of mouth cancer if you:

- **Stop using tobacco or don't start.** If you use tobacco, stop. If you don't use tobacco, don't start. Using tobacco, whether smoked or chewed, exposes the cells in your mouth to dangerous cancer-causing chemicals.
- **Drink alcohol only in moderation, if at all.** Chronic excessive alcohol use can irritate the cells in your mouth, making them vulnerable to mouth cancer. If you choose to drink alcohol, limit yourself to one drink a day if you're a woman or two drinks a day if you're a man.
- **Eat a variety of fruits and vegetables.** Choose a diet rich in fruits and vegetables. The vitamins and antioxidants found in fruits and vegetables may help reduce your risk of mouth cancer.
- **Avoid excessive sun exposure to your lips.** Protect the skin on your lips from the sun by staying in the shade when possible. Wear a broad-brimmed hat that effectively shades your entire face, including

your mouth. Apply a sunscreen lip product as part of your routine sun protection regimen.

- **See your dentist regularly.** As part of a routine dental exam, ask your dentist to inspect your entire mouth for abnormal areas that may indicate mouth cancer or precancerous changes.

**Oral Cancer Incidence (New Cases) by Age, Race, and Gender<sup>[21]</sup>**

Oral cancer rates have increased approximately 15% from the mid 1970s until the latest (2004) National Cancer Institute Survey. There are significant disparities in some population groups, with higher rates of increase in minority men.

Table 1 presents oral cancer incidence rates for adult men and women of all age groups and for selected racial and ethnic groups.

**Oral Cancer Incidence (Table 1)**

- Overall, 10.5 adults per 100,000 will develop oral cancer.
- Oral cancer rates are significantly higher for males than for females.
- Oral cancer rates are higher for Hispanic and Black males than for White males.
- Oral cancer rates increase with age. The increase becomes more rapid after age 50 and peaks between ages 60 and 70.

**Table 1: Oral Cancer Incidence by Age, Race, and Gender.**

| Race                                 | Gender     | All Ages | 0 to 19 | 20 to 29 | 30 to 39 | 40 to 49 | 50 to 59 | 60 to 69 | 70 to 79 | 80+  |
|--------------------------------------|------------|----------|---------|----------|----------|----------|----------|----------|----------|------|
| <b>All Races</b>                     | <b>All</b> | 10.5     | 0.2     | 0.8      | 2.4      | 8.7      | 21.7     | 33.9     | 40.2     | 40.0 |
| <b>Male</b>                          |            | 15.5     | 0.2     | 0.8      | 2.8      | 12.7     | 33.8     | 51.9     | 58.9     | 59.4 |
| <b>Female</b>                        |            | 6.1      | 0.2     | 0.9      | 1.9      | 4.7      | 10.2     | 17.9     | 26.0     | 29.4 |
| <b>White</b>                         | <b>All</b> | 10.6     | 0.2     | 0.8      | 2.1      | 8.5      | 21.8     | 34.7     | 41.7     | 41.2 |
| <b>Male</b>                          |            | 15.7     | 0.2     | 0.7      | 2.5      | 12.5     | 33.8     | 52.7     | 60.7     | 62.0 |
| <b>Female</b>                        |            | 6.1      | 0.2     | 0.8      | 1.7      | 4.4      | 10.1     | 18.4     | 27.0     | 30.0 |
| <b>Black</b>                         | <b>All</b> | 10.7     | 0.3     | 0.9      | 2.3      | 10.2     | 25.9     | 35.8     | 37.0     | 27.6 |
| <b>Male</b>                          |            | 17.2     | 0.4     | 0.8      | 2.7      | 14.6     | 43.2     | 61.0     | 61.6     | 43.4 |
| <b>Female</b>                        |            | 5.7      | 0.2     | 0.9      | 2.0      | 6.2      | 11.3     | 16.2     | 20.5     | 19.5 |
| <b>American Indian/Alaska Native</b> | <b>All</b> | 7.4      | 0.1     | 0.5      | 2.1      | 6.6      | 17.5     | 28.9     | 22.6     | 16.6 |
| <b>Male</b>                          |            | 9.7      | 0.0     | 0.3      | 3.1      | 8.8      | 24.7     | 39.5     | 29.0     | 15.2 |
| <b>Female</b>                        |            | 5.3      | 0.1     | 0.6      | 1.0      | 4.6      | 10.9     | 19.7     | 17.4     | 18.5 |
| <b>Asian or Pacific Islander</b>     | <b>All</b> | 7.9      | 0.2     | 1.3      | 3.7      | 8.1      | 15.0     | 23.4     | 25.1     | 31.2 |
| <b>Male</b>                          |            | 10.9     | 0.2     | 1.2      | 4.2      | 11.5     | 21.8     | 34.4     | 36.0     | 35.6 |
| <b>Female</b>                        |            | 5.5      | 0.2     | 1.3      | 3.2      | 5.1      | 9.1      | 14.2     | 17.2     | 28.2 |
| <b>Hispanic</b>                      | <b>All</b> | 6.1      | 0.2     | 0.5      | 1.3      | 4.4      | 11.4     | 20.1     | 25.4     | 27.8 |
| <b>Male</b>                          |            | 9.2      | 0.2     | 0.5      | 1.5      | 6.1      | 17.3     | 32.9     | 38.7     | 39.7 |
| <b>Female</b>                        |            | 3.6      | 0.2     | 0.6      | 1.0      | 2.7      | 5.9      | 9.2      | 15.6     | 20.9 |
| <b>White Hispanic</b>                | <b>All</b> | 6.3      | 0.2     | 0.5      | 1.3      | 4.6      | 11.7     | 20.4     | 25.6     | 28.2 |
| <b>Male</b>                          |            | 9.3      | 0.2     | 0.5      | 1.6      | 6.3      | 17.7     | 33.4     | 38.8     | 40.3 |
| <b>Female</b>                        |            | 3.7      | 0.2     | 0.6      | 1.1      | 2.8      | 6.0      | 9.4      | 15.7     | 21.2 |
| <b>White Non-Hispanic</b>            | <b>All</b> | 11.3     | 0.2     | 0.9      | 2.4      | 9.4      | 23.5     | 36.8     | 43.6     | 42.3 |
| <b>Male</b>                          |            | 16.7     | 0.2     | 0.9      | 2.9      | 14.1     | 36.5     | 55.4     | 63.2     | 63.9 |
| <b>Female</b>                        |            | 6.5      | 0.2     | 0.9      | 1.9      | 4.8      | 10.8     | 19.8     | 28.4     | 30.7 |

Incidence of oral cancer in cases per 100,000, by selected characteristics Source: Surveillance, Epidemiology, and

End Results(SEER) Program \* Stat Database: Incidence - SEER 17 Regs Limited-Use + Hurricane Katrina

Impacted Louisiana Cases, Nov 2008 Sub (2000-2006), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2009, based on the November 2008 submission.

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