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Review Article

A Review on Oral Cancer (Nicotine and Alcohol)

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Abstract

Oral cancers include those that affect the lips, the front two-thirds of the tongue, the gums, cheeks, and roof and floor of the mouth. Oral cancers are on the rise, particularly among young people, so it is important to learn about early signs and symptoms and, even better, how to prevent them. More men than women are diagnosed with oral cancer, and its leading causes include tobacco and alcohol consumption. Sometimes the first sign of oral cancer is a small and seemingly harmless sore, so it's important to visit your dentist or doctor to discuss any concerns you might have about your lips and mouth. Treatments for oral cancers include Surgery, radiation therapy and chemotherapy.

Keywords: oral cancer; tobacco; alcohol; radiation therapy

Introduction

Oral cancer includes cancer of the lips, tongue, cheeks, floor of mouth, hard palate, gums and minor salivary glands. Oral cancer usually occurs in people over the age of 45 but can develop at any age. Lip and oral cavity cancer occur when malignant (cancerous) cells form on the lips or within the oral cavity. As cancer progresses, it may invade deeper into other surrounding tissue. Cancers that develop in the lips or oral cavity are usually squamous cell carcinoma. Tumours of the minor salivary glands – like adenoid cystic carcinomas, mucoepidermoid carcinomas and sarcomas are rarer.

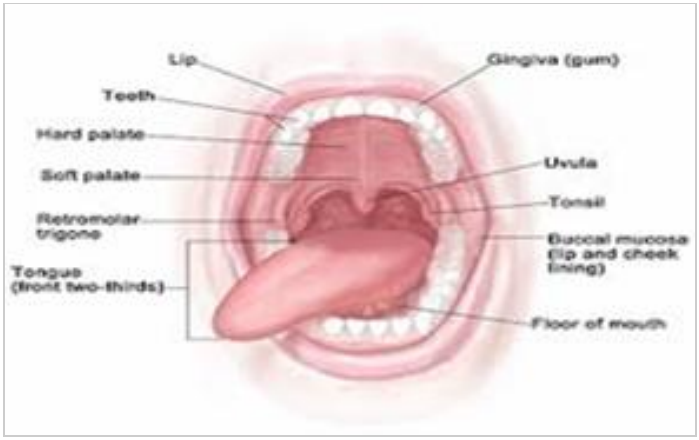

Figure 1: oral cavity.

The oral cavity includes the:

Retromolar trigone (the area behind the wisdom teeth), Hard palate (the roof of the mouth), Floor of the mouth (the space underneath the tongue), Buccal mucosa (the inner lining of the cheeks and lips), Front section of the tongue, Gums, lips and teeth.

Figure 2: oral lip ulcer and white patches.

Red part of the lip

Tobacco use is known as a major risk factor for oral and many other cancers. All tobacco products, including cigarettes, cigars, pipe tobacco, chewing tobacco, and snuff, contain the Poisonous substances (toxins), Cancer-causing agents (carcinogens), Nicotine, an addictive substance All tobacco products, including cigarettes, cigars, pipes, and smokeless tobacco (chewing tobacco, snuff, or a type of chewing tobacco called betel quid) are linked to head and neck cancer (except for salivary gland cancers). Drinking any type of alcohol, such as beer, wine, or liquor, also raises the risk of getting cancers of the mouth, throat, and voice box.

About 70% of cancers in the oropharynx (which includes the tonsils, soft palate, and base of the tongue) are linked to human papillomavirus (HPV), a common sexually transmitted virus. Overexposure to ultraviolet (UV) rays from the sun, tanning beds, or sunlamps is a cause of cancer on the lips. Occupational exposures, or being exposed to certain substances while on the job, can increase the risk of getting cancers in the nasopharynx. Working in the construction, textile, ceramic, logging, and food processing industries can cause people to be exposed to substances like wood dust, formaldehyde, asbestos, nickel, and other chemicals. An infection with the Epstein-Barr virus, a cause of infectious mononucleosis and other illnesses, can raise the risk of cancers in the nose, behind the nose, and cancers of the salivary glands.

Figure 3: Smoking cigarettes

Cigarettes

Cigarettes, the most common form of tobacco used, causes about 90% of all lung cancers, according to the American Lung Association. Smokers are also at a 10 times higher risk for oral cancer compared to non-smokers. Smoking is linked to increased risk for more than 12 other types of cancer, too. In addition, cigarette smoking is linked to nearly 1 in 5 deaths in the U.S. Cigarettes contain more than 60 known cancer-causing agents.

Cigars and pipes

Cigars and pipes are often believed to be a less harmful way to smoke tobacco. However, even when not inhaling, cigar and pipe smokers are at increased risk for cancer of the oral cavity, oesophagus, voice box, and lungs. Pipe smokers also are at increased risk for lip cancers in areas where the pipestem rests. In addition, cigars take longer to burn and contain more tobacco than cigarettes, increasing the amount of second-hand smoke exposure.

Chewing tobacco and snuff

Spit tobacco, also known as chewing tobacco and snuff, are forms of tobacco that are put between the cheek and gum. Chewing tobacco can be in the form of leaf tobacco (which is packaged in pouches), or plug tobacco (which are packaged in "brick" form). Snuff is a powdered form of tobacco, usually sold in cans. The nicotine is released from the tobacco as the user "chews."

Although chewing tobacco and snuff are considered smokeless tobacco products, harmful chemicals including nicotine are ingested. More than 28 cancer-causing chemicals have been found in smokeless tobacco.

Chewing tobacco and snuff can cause cancer in the cheek, gums, and lips. Just as with a pipe, cancer often occurs where the tobacco is held in the mouth. Cancer caused by smokeless tobacco often begins as leucoplakia, with a whitish patch that develops inside the mouth or throat. Or the cancer may erythrolein. With this condition, a red, raised patch develops inside the mouth. It's also linked to oesophageal and pancreatic cancers.

Cigars became a trend in the 1990s, attracting the young and the old. Many people think cigars are less harmful to their health. But cigars actually pose the same risk for oral cancer as cigarettes do. Many cigar smokers don't inhale. But their risk for oral, throat, and oesophageal cancers is the same as for cigarette smokers. Consider these facts:

- Compared with non-smokers, regular cigar smokers are 4 to 10 times more likely to die from oral cancer, oesophageal cancer, and laryngeal cancer.
- Cigar smokers may spend an hour or more smoking 1 large cigar that can contain the same amount of nicotine as a full pack of cigarettes. And even unlit cigars, when held in the mouth for an extended period of time, promote nicotine absorption.

- Second-hand smoke from cigars contains toxins and cancer-causing agents (carcinogens) similar to second-hand cigarette smoke, but in higher concentrations.

Figure 4: Toung cancer.

Other potential symptoms of oral cancer include [2]:

- White patch (called leucoplakia) or red patch (called erythroplakia) on the inside of the mouth
- Non-healing scab on the lip or mouth ulcer
- Bleeding from the mouth that is unrelated to an injury
- Pain and/or difficulty chewing
- Swollen glands (lymph nodes) or a mass in the neck
- Jaw pain or swelling
- Difficulty swallowing, chewing, speaking, or moving the tongue or jaw
- Numb tongue or area of the mouth
- Loose teeth or dentures
- Persistent bad breath

Figure 5: Oral Growth.

Causes

Perhaps the most significant risk factor for developing oral cancer is tobacco use.1 Smoking cigarettes, cigars, and pipes all increase your risk of cancer anywhere in the mouth or throat. Moreover, smokeless or oral tobacco products often called "dip" or "chew," heighten the risk for developing cancers of the cheek, gums, and inner part of the lips.

Other risk factors linked to the development of oral cancer include:

- Heavy alcohol consumption: Risk dramatically increases when a person both smokes and drinks heavily.
- Oropharynx cancer (occurs in tonsils, base of tongue, etc.) is the type of cancer commonly associated with HPV infection [4].
- Eating a diet deficient in fruits and vegetables.
- Being exposed to excess sunlight (increases risk for lip cancer).
- Having a weakened immune system.
- Having certain underlying health problems like graft-versus-host disease or a genetic syndrome like Fanconi anemia.
- Chewing betel quid, a stimulant drug that's ingested like chewing tobacco and often mixed with tobacco.

Oral cancer is more common in men, perhaps because men are more likely to use tobacco and alcohol than women.

Oral cancer is also more common in adults over age 55, although this is changing as cancers related to HPV infection are increasing in number.

Some of the tests involved in staging include [5]:

- HPV testing of the biopsy specimen.
- Magnetic resonance imaging (MRI).
- Computed tomography (CT) scan of the neck and chest.
- Positron emission tomography (PET) scan.
- Dental X-rays.
- Barium swallow (gastrointestinal series of X-rays of the esophagus and stomach).

The oral cavity includes the:

- Retromolar trigone (the area behind the wisdom teeth)

- Hard palate (the roof of the mouth)
- Floor of the mouth (the space underneath the tongue)
- Buccal mucosa (the inner lining of the cheeks and lips)
- Front section of the tongue
- Gums, lips and teeth
- Red part of the lip

Additional symptoms of lip and oral cavity cancer may include:

- Lump or thickening on the lips, gums, mouth and/or neck
- A white or red patch on the gums, tongue, tonsils or lining of the mouth
- Bleeding from the lip, mouth, chin or cheek
- Pain or numbness in the lip, mouth, chin or cheek
- Loose teeth or dentures that no longer fit well
- Trouble chewing, swallowing or moving the tongue or jaw
- Sore throat or feeling that something is caught in the throat
- Swelling of the jaw or neck
- Change in voice
- Weight loss

Stages of lip and oral cavity cancer

The staging system most often used for oral cavity or oropharyngeal cancers is the American Joint Committee on Cancer (AJCC) TNM system, which is based on three key pieces of information:

The extent of the tumour (T): How large is the main (primary) tumour and which, if any, tissues of the oral cavity or oropharynx have been affected?

The spread to nearby lymph nodes (N): Has cancer spread to nearby lymph nodes? If so, how many, are they on the same side where cancer started and how large are they?

The spread (metastasis) to distant sites (M): Has cancer spread to distant organs such as the lungs?

Numbers or letters after T, N and M provide more details about each of these factors. Higher numbers indicate that a patient's cancer is more advanced. Once a person's T, N and M categories have been determined, this information is combined in a process called stage grouping to assign an overall stage.

Cancer can be described as the uncontrolled growth of abnormal cells. Cancer that develops in the mouth or throat is termed as oral cancer. Tumours caused by oral cancer can appear on the lips, the floor of the mouth, cheeks, tongue, sinuses, hard and soft palate, and pharynx. Thus, in many cases, a dentist first detects oral cancer during routine dental check-ups. Early detection is key to the treatment of oral cancer. If left untreated, this form of cancer can be fatal.

Oral cancer is usually the result of a genetic mutation. This mutation makes normal cells grow abnormally fast and does not allow the cells to die. It is not clear what causes these mutations. As the cells keep growing, they form tumours. The tumours can then spread to other places in the mouth and throat as well as to other organs.

There are 5 stages of Oral cancer.

Stage 0: In this stage, the tumor affects only the top layer of cells and is often too small to be noticed.

Stage I: The tumour grows to about 2cm in size but is limited to one part of the mouth or throat.

Stage II: The tumour grows to a size of 2-4cm and may start affecting nearby parts of the mouth and throat.

Stage III: The tumour grows bigger than 4cm and may also be noticed in other parts of the mouth and throat.

Stage IV: The tumour spread to other organs and lymph nodes.

Risk of developing Oral cancer if:

- you smoke cigarettes, cigars or tobacco pipes.
- you chew tobacco.
- you suffer from an HPV infection.
- you drink alcohol excessively.
- your face is exposed a lot to the sun.
- you have a weakened immune system.
- you do not get adequate nutrition.
- you have a history of oral cancer.
- someone in your family has Oral cancer.

Men have a higher risk of Oral cancer as compared to women.

- The symptoms of Oral cancer include:
- sore in the mouth or lip that does not heal
- growth or mass anywhere in the mouth or throat
- white or red patches in the mouth or throat
- loose teeth
- bleeding from the mouth
- trouble swallowing
- trouble wearing dentures
- chronic earache
- sore throat
- unexplained weight loss
- tongue pain
- stiffness in the jaw numbness in the face, lower lip or neck

Most cases of oral cancer are detected by dentists during routine check-ups. During a physical exam, the dentist will look for patches and growths in the mouth. If any suspicious lesions or tumours are found, a brush biopsy or tissue biopsy may be conducted. This may be followed by an X-ray, CT scan, MRI scan, PET scan, and endoscopy.

Treatment

If an abnormal area has been found in the oral cavity, a BIOPSY will determine whether it is cancer. Usually, you are referred to a head and neck surgeon, who removes part or all of the lump or abnormal-looking area. A pathologist examines the tissue under a microscope to check for cancer cells. Almost all oral cancers are squamous cell carcinomas, since squamous cells line the oral cavity.

Surgery

Surgery to remove the tumour in the mouth is the usual treatment for patients with oral cancer. If there is evidence that the cancer has spread or a concern that it has spread, the surgeon may also remove lymph nodes in the neck. If the disease has spread to muscles and other tissues in the neck, the operation may be more extensive.

Radiation Therapy

Radiation therapy, also called radiotherapy, is the use of high-energy rays to damage cancer cells and stop them from growing. Like surgery, radiation therapy is local therapy, affecting only the cells in the treated area. The energy may come from a large machine, or external radiation. Patients with large tumours may need both surgery and radiation therapy.

Chemotherapy

Chemotherapy is the use of drugs to kill cancer cells. Researchers are looking for effective drugs or drug combinations to treat oral cancer. They are also exploring ways to combine chemotherapy with other forms of cancer treatment to help destroy the tumour and prevent the disease from spreading.

Figure 6

Oral cancer does not go away on its own and should not be ignored. In its later stages, oral cancer can be fatal. In these stages, treatment cannot cure the disease and is aimed at only reducing the speed at which it progresses. Hence, it is important to seek treatment in the early stages of oral cancer. Complications that can arise from oral cancer include: changes in the appearance of the mouth, speech problems, difficulty eating and swallowing, depression and anxiety. The ideal treatment for a patient depends on many factors including the stage at which the cancer is diagnosed, the patient's age, overall health, and personal preferences. In the case of small tumours restricted to one area, surgery may be advised. This is aimed at removing the tumours. Surgery may be followed by radiation to ensure that no part of a tumour has been left behind. If a tumour is large, radiation may precede surgery to allow a tumour to shrink. Chemotherapy is another form of treatment used for oral cancer. This may be combined with radiation. Targeted therapy may also be used to treat oral can.

Oral cancer is the 11th most common cancer in the world, accounting for an estimated 300,000 new cases and 145,000 deaths in 2012 and 702,000 prevalent cases over a period of five years (old and new cases) For this chapter, oral cancers include cancers of the mucosal lip, tongue, gum, floor of the mouth, palate, and mouth, corresponding to the International Classification of Diseases, 10th revision [ICD-10], codes C00, C02, C03, C04, C05, and C06, respectively. Two-thirds of the global incidence of oral cancer occurs in low- and middle-income countries (LMICs); half of those cases are in South Asia. India alone accounts for one-fifth of all oral cancer cases and one-fourth of all oral cancer deaths Oral Cancer in Men (All Ages): Global Incidence, Mortality, and Prevalence, World Health Organization Geographic Classification, 2012. Oral Cancer in Women (All Ages): Global Incidence, Mortality, and Prevalence, World Health Organization Geographic Classification, 2012.Tobacco use, in any form, and excessive alcohol use are the major risk factors for oral cancer. With dietary deficiencies, these factors cause more than 90 percent of oral cancers.

Conclusion

Oral cancer incidence and mortality are high in IndiaThe major causes of oral cancer worldwide remain tobacco in its many different forms, heavy consumption of alcohol, and, increasingly, infection with certain types of HPV. Although the relative contribution of risk factors varies from population to population, oral cancer is predominantly a disease of poor people. Prevention of this devastating disease can come from fundamental changes in socioeconomic status, as well as from actions to reduce the demand, production, marketing, and use of tobacco products and alcohol.

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