Epidemiology of Oral Cancer

Dr. Alhan Ahmed

Oral cancer term includes cancers of lip, tongue, buccalmucosa, floor of mouth and pharynx.The epidemiology of oral cancer is usually described in terms of the yearly incidence of new cases and mortality per 100,000 of a given population. Tobacco use and excessive alcohol consumption have been estimated to account for about 90 % of cancers in the oral cavity; the oral cancer risk increases when tobacco is used in combination with alcohol or areca nut.

INCIDENCE

The incidence of oral cancer could be considered according to:

Sex

Males in a given population almost invariably have higher age specific incidence rates than females for all types of oral cancer.

Age

Incidence increases with age and 85 % of cases are found in those aged 50 and above.

Type

the majority of malignancies [90–95%] are squamous cell carcinomas. There is great variation, however, in sex incidence between various sites in the oral cavity.

Etiology of oral cancer

1. **Established risk factors:**

a. **Smoking tobacco:** It is addictive. Smoked tobacco contains thousands of chemical compounds. Many of these compounds are not only irritants and toxin, but they are also carcinogens.

CONSTITUENTS OF TOBACCO SMOKE

Tobacco smoke is a complex mixture of several thousand chemical compounds

Nicotine

Nicotine is among the most toxic of all poisons and acts with great speed (**nitrosamines, which are potent carcinogens component)**. It is the pharmacological agent in the tobacco smoke that causes addiction among smokers. The addictive effect of nicotine is linked to its capacity to trigger the release of dopamine—a chemical in the brain that is associated with the feelings of pleasure.

Tar

Tar is a sticky brown substance which can stain smokers' fingers and teeth yellow brown. It also stains the lung tissue.Benzopyrene as a carcinogen is a prominent polycyclic aromatic hydrocarbon found in tar.

Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless, poisonous gas. Carbon monoxide interferes with uptake of oxygen in the lungs and with its release from the blood to the tissues that need it.

b. **ALCOHOL**

By 1988 International Agency for Research on Cancer accepted both tobacco smoking and alcohol consumption as independent risk factors for oral cancer. Combined effect of alcohol and tobacco is greater than the sum of the two effects independently.

c. **MOUTHWASH USE**

Mouthwashes with high alcohol content [25% or higher] may increase risk of oral cancer. Risks generally increased in proportion tofrequency and duration of mouthwash use.

Predisposing factors

a. VITAMINS AND ESSENTIAL MINERALS

Vitamin A: Risk of oral cancer has been inversely associated with consumption of vitamin A, and also consumption of fruits and vegetables in many studies.
Vitamin C: There is a tenous association of vitamin 'C' with a protective effect against oral, pharyngeal and esophageal cancer.
Vitamin E: Vitamin E like β-carotene is anti-oxidant. Higher serum vitamin levels appear to be associated with decreased risk of oral cancer. Vitamin E use may have some protective effect against leukoplakia and carcinomas.

b. OCCUPATION

Thereis increased risk for oral cancer and pharyngeal cancer for workers exposed to formaldehyde.There is higher incidence of lip cancer in outdoor and rural population than in office workers or urban population. This may be due to exposure to sunlight and UV radiation.

c. CHEMICAL AGENTS

Exposure to chemical agents like aromatic amines, Alfa toxins, polycyclic aromatic hydrocarbons, etc. is predisposing factor for oral cancer.

d. VIRAL INFECTION

Infection with viruses: There are several viruses that seem to increase the risk for oral cancer such as Human papillomaviruses (HPV) , Epstein-Barr virus is a virus and Herpes simplex viruses cause a viral infection.

TRAUMA

Many human cases are described of an oral cancer at the site of chronic trauma arising from a broken tooth, a denture clasp, or an ill-fitting denture flange or excrescence. Studies indicate that denture wearing per se is not a risk factor, but that chronic ulceration from an unsatisfactory appliance may promote a neoplasm in the presence of other risk factors.

PATHOGENESIS

The most common type of oral cancer is epidermoid carcinoma (squamous cell carcinoma). Epidermoid carcinoma originates in abnormal mucosa as either leukoplakia, erythroplakia or speckled leukoplakia. This disease most commonly begins in a leukoplakic lesion which can be smooth or rough, flat or elevated, ulcerated or intact. Leukoplakia is manifested histologically by a thickening of the mucosa.

POTENTIALLY MALIGNANT LESIONS

Main potentially malignant lesion is:
• Leukoplakia
• Erythroplakia
• Erosive lichen planus
• Submucosal fibrosis.
Such lesion as leukoplakia and erythroplakia can precede the development of malignancies. However the rate of malignant transformation is very low 2–6 percent.

THE IMPORTANCE OF EARLY DETECTION

• Early detection saves lives. With early detection and timely treatment, deaths from oral cancer could be dramatically reduced
• The five-year survival rate for those with localized disease at diagnosis is 81 percent compared with only 30 percent for those whose cancer has spread to other parts of the body.

LEVELS OF PREVENTION FOR ORAL CANCER

Primary Prevention

1. Avoid tobacco and alcohol use.
2. Avoid betel nut chewing.
3. Avoid smoking.
4. Avoid exposure to sun.
5. Ensure a healthy diet free from vitamin and nutritional deficiency.
6. Dentists may be able to influence politicians and communities to adopt relevant policies, but more importantly they can directly influence smokers to stop using tobacco, reduce alcohol consumption and improve their diet.

Secondary Prevention

Patients whose cancer is detected at an early stage generally have much longer survival times than those with late-stage disease.

• Screening of high risk groups

• *Biopsy:* any suspicious oral mucosal lesion including any non-healing ulcer [more than two weeks] must be biopsied. Biopsy should be sufficiently large to include enough suspect and apparently normal tissues for correct diagnosis. An excisional biopsy should be avoided unless the lesion is very small as it will destroy for the surgeon or radiotherapist the clinical evidence of the site and character of lesion.

• *In vitro staining:* is advised where it is difficult to decide which is more appropriate area of biopsy, especially if there if there are widespread lesions. Staining with toludine blue followed by a rinse with 1 percent acetic acid and then saline may stain the most suspicious area and indicate those which need to be biopsied.

Tertiary Prevention

• Surgery, radiotherapy, and chemotherapy.

• In order to stop the recurrence and spread of oral cancers, dentists and other health specialists should work together to provide multi-disciplinary support for patients.

• Treated patients may still have dental needs which dentists should monitor to maintain life quality. There may be special needs as well.

• Prevention of caries by topical fluoride application, dietary advice.

• Management of a dry mouth, and prosthetic rehabilitation following surgery and radiation therapy.

Rehabilitation after Oral Cancer

Rehabilitation may vary from person-to-person depending on the type of oral cancer treatment, and the location and extent of the cancer. Rehabilitation may include:

• *Dietary counseling:* Many patients recovering from oral cancer surgery have difficulty eating, so it is often recommended that they eat small meals consisting of soft, moist foods.

• *Surgery:* Some patients may benefit from reconstructive or plastic surgery to restore the bones or tissues of the mouth, returning a more normal appearance.

• *Prosthesis:* If reconstructive or plastic surgery is not an option, patients may get benefit from dental or facial-part prosthesis to restore a more normal appearance. Special training may be needed to learn to use a prosthetic device.

• *Speech therapy:* If a patient experiences difficulty in speaking following oral cancer treatment, speech therapy may help the patient relearn the process.