Community Dentistry

Epidemiology of Oral Cancer

Cancer is a broad term. It describes the disease that results when cellular changes cause the uncontrolled growth and division of cells.

☒ Cancer may be regarded as a group of diseases characterized by:

-Abnormal growth of cells.

-Ability to invade adjacent tissues and even distant organs.

-The eventual death of the affected patient, if the tumor has progressed beyond the stage when it can be successfully treated.

Types of cancers

1) Carcinoma
2) Sarcoma
3) Lymphoma
4) Leukemia

Oral Cancer is one of the ten most common cancers in the world. Oral cancer term includes cancers of lip, tongue, buccal mucosa, floor of mouth and pharynx Oral cancer is classically described as an indurated, ulcerated lump or sore that may or may not be painful and is often associated with cervical lymph adenopathy. 90 to 95% of all oral cancers are squamous cell carcinomas.

Etiology of oral cancer:

❖ Host Factors:

I. **Age:** Incidence increases with age and 85 % of cases are found in those aged 50 and above. Older age shows increase incidence in carcinoma whereas the younger age shows increase in sarcoma.

II. **Race**: Whites develop lip melanoma more frequently than the blacks. Certain odontogenic tumours are more common in black races.

III. **Gender:** commonly Males are more prone than females **.** Cancers of tongue and buccal mucosa are more common in males. Cancer of lip and Malignant melanoma are more common in women than in men.

IV. **Genetic factors**: Discovery of oncogenes introduced a time in which it is possible to identify genetic elements involved in the initiation and progression of malignant disease.

V. **Occupation:** Textile workers show an increase in oral cancer. Leather workers show an increase in cancer of buccal mucosa, larynx and pharynx.

VI. **Immunity**: Kaposi sarcoma is more common in AIDS patients.

VII. **Social class**: There is a definite relationship between socioeconomic status and frequency of cancer. Low-income groups show increase in cancer of oral cavity.

VIII. **Customs and habits:** Smoking increases the incidence of cancer. Tobacco chewing, pan chewing, spicy food increase the rate of cancer of floor of mouth and buccal mucosa. Alcohol consumption also increases the chance for cancer.

Constituents of tobacco smoke

Tobacco smoke is a complex mixture of several thousands of chemical compounds:

1-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. **2-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.

3-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.

❖ Agent Factors:

I. **Biological:** (a) Virus (HIV, HSV), (b) Fungus (Candida).

II. **Chemical**: Arsenic, dyes, nickel, aromatic amines, chromium.

III. **Mechanical**: Sharp tooth, any other source of chronic irritation like ill fitting dentures, chronic sores from jagged teeth, etc.

IV. **Nutritional agents**: Precarcinogens in food (saccharin, aflatoxin), increased consumption of fat, deficiency of folic acid, protein deficiency, increased consumption of red chilly powder, decrease in copper, zinc, vegetables, vitamins E and C.

❖ Environmental Factors:

I. **Water contaminants**: It includes some organic pollutants like chloroform.
II. **Air pollution**: Air pollution caused by the release of a number of gases from the automobiles and factories, e.g. carbon dioxide.
III. **Geographic variations**: In Netherlands, buccal mucosa is most commonly affected and is more often seen in males. In Switzerland, lip, tongues are the sites most affected and is often seen in males. In Canadian Eskimos, cancer of salivary gland is more common. In Srikakulam, palatal cancer is most common.
IV. **Solar heat**: Prolonged exposure to sunlight causes melanoma.
V. **Industrialization**: The release of various toxins by the industries contaminates water and air, which may lead to cancer.

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.

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.

☒ 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 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.
- 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 difficult 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.