ORAL MALIGNANCIES: ROLE OF PREVENTION AND EARLY DETECTION

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Introduction

The oral cavity is that part of the upper aerodigestive tract which extends from the mucocutaneous junction at the vermillion border of the lip to the anterior surface of the faucial arch. It is lined by squamous epithelium containing interspersed minor salivary glands and it also contains dento-alveolar structures that support the upper and lower dentition. Primary tumors of the oral cavity may arise from the surface epithelium, minor salivary glands or submucous soft tissue as well as from dental structure, bone or neurovascular tissue. Squamous cell carcinoma of the oral cavity forms more than 90% of all newly diagnosed cases of oral cancer, with the majority of patients being males. A rising incidence has been observed in females over the past 50 years. Anatomical sites in the oral cavity that have been described by the International Union Against Cancer (UICC)/ American Joint Committee on Cancer (AJCC) Staging System are the tongue, floor of mouth, gingiva, buccal mucosa, retromolar trigone and hard palate. The tongue and the floor of mouth are the most common sites of origin for primary squamous cell carcinoma in the oral cavity in the Western World. In other parts of the world e.g. Middle East and Asia, the retromolar trigone and buccal mucosa are the most frequently encountered primary sites due to tobacco chewing and the chewing of betel nuts. Despite controversy and debate during the last century between different health care disciplines regarding the best treatment of oral cancer using radiation, surgery or chemotherapy, surgery still plays a primary role in the control of the disease.

Disease Epidemiology

Oral cavity cancers account for about 3% of all cancers diagnosed each year in north America. (1,2) This is estimated to be 27,000 newly diagnosed cases in the United States and 3,200 cases in Canada. Slightly more than 10,000 Americans and 1,000 Canadians will die of oral cancer each year. Studies from around the globe show that for both sexes combined cancer of the mouth and pharynx ranks sixth overall behind lung, stomach, breast, colon, rectum and cervix uteri in that order. The rates range from a low of 1.8/100,000 per year to a high of 47/100,000 per year. The highest rates of oral cancer in the world are found in France, the Indian subcontinent, Brazil and central/eastern Europe. There are also marked differences between countries in the same geographic regions.

The incidence of oral cancer increases with age in all parts of the world. In the West, 98% of the patients are over 40 years of age. In the high prevalence areas of the world, many of the patients are less than 35-years-old owing to heavy usage of various forms of tobacco. Furthermore, it is now clear that in many Western countries, there has been an alarming rise in the incidence of oral cancer during the past two or three decades particularly among younger men a trend that appears to be continuing.

In industrialized countries, men are affected two to three times as often as women. The most important risk factors are alcohol and tobacco consumption for intraoral cancer and sun exposure for lip cancer in those who work outdoors. The incidence of tongue and other intraoral cancer for woman can be greater or equal to that of men in high incidence areas such as India

where chewing tobacco is also common among women. There has been a gradual increase of the number of female patients reflected by the change in male to female ratio in the Western societies.

The reported head and neck cancer cases in Saudi Arabia by the National Cancer Registry for the year 2002 was approximately 700 new cases, (3) and we believe that this number is increasing annually as the aging population is increasing.

Risk Factors

Tobacco
There is absolutely no doubt that on a global scale the use and abuse of tobacco products is the major cause of oral cancer. Typically 90% of men and 60% of women with oral carcinomas use tobacco. The incidence rate of oral carcinoma in smokers is six to ten times greater when compared to non-smokers.

Alcohol
It is very difficult to separate the effects of alcohol and tobacco as most heavy alcohol consumers also use tobacco. Nevertheless, some cohort and case control studies have found an increased risk of upper aerodigestive tract cancer associated with alcohol drinking in non-smokers. The epidemiological evidence shows that all of alcoholic drinks are dangerous if heavily consumed.

Viruses
The knowledge of viruses as a human carcinogen has improved in the past two to three decades. Viruses contribute to the multi-step process of carcinogenesis in many human neoplasms. Human papilloma virus, especially human papilloma 16, is the most common type associated with both cervical and oral cancer. In vitro studies show that high-risk HBV types can immortalize primary human oral epithelial cells.

Presenting Signs and Symptoms
The common presenting symptoms include pain, oral ulcer, oral mass, and neck mass. While the common presenting signs include leukoplakia, erythroplakia, exophytic mass, oral ulcer and neurological alterations.

Outcome & Prognosis
Despite the improvements in surgical and radiotherapeutic techniques, intraoral squamous cell carcinoma has relatively unfavorable prognosis with an overall five-year survival rate of 35 – 50%. The survival rate has regrettably remained virtually unchanged over the past three decades. The increase in the incidence of oral cancer accentuates this mortality from the cancer.

Several parameters have been adapted and applied by clinicians to evaluate the prognosis of oral cancer. These parameters can be divided into epidemiological parameters which include age, sex, race, alcohol and tobacco intake and comorbidity; clinical parameters which include the TNM classification, stage, and the site of the primary tumor; and histological parameters which include the marginal status, the perineural or perivascular invasion, histopathological grading, tumor thickness and extracapsular spread.

The single most important factor affecting long-term results after treatment of carcinoma of the oral cavity is the stage of the disease at the time of presentation. For early stage tumors excellent cure rate is achieved. The five year survival rate for patients with oral cancer treated at Memorial Sloan-Kettering Cancer Center between 1986 and 1995 showed that for Stage I oral cancer the five year disease-specific survival was more than 90% while for Stage II, III, IV 80%, 65%, 55%, respectively. The overall survival in the same center was site dependent; with tumors in the buccal mucosa and retromolar trigone having the worst outcome. (4)

Magnano et al(5,6) found that the T stage was a consistent and dependent predictor of pathologically involved cervical lymph nodes. In addition, maximal tumor diameter has been shown to predict local recurrence in tumors arising from the lower lip, oral cavity and oropharynx. Pernot in 1996 reported on 565 patients in which he showed that the five-year survival for patients with T1 lesion was 70% compared to 29% in patients with T3 disease(7).

It is not surprising that the presence of clinically positive lymph nodes at the time of presentation is probably the single most important factor in determining the outcome and prognosis. In general patients presenting with neck node metastases do half as well as patients who present with a primary tumor only. Jones et al(8) performed a univariate and multivariate analysis of a number of tumor factors and prognosis in oral cancer on 524 patients. Their study showed that only the T stage and the N stage were significant as predictors for survival.

Mamelle et al(9) reviewed 914 patients and his multivariate analysis showed that the number of positive nodes was a significant and independent predictor of survival.

Olsen et al(10) has shown that the number of positive lymph nodes reflects the prognosis and overall survival in 284 patients that he studied. This information is in agreement with a study that Shah(11) performed on 704 patients showing that the failure rate was significantly higher as the number of positive nodes increased.

Screening Methods Overview
A routine Head and neck examination in any patient above the age of forty who has any of the risk factors mentioned earlier. A focused oral examination is mandatory with proper inspection and palpation of all the high-risk areas in high risk patients.

Prevention
Primary prevention is the approach that concentrates on eliminating the risk factors. Educating the public on these risk factors is the first step in primary prevention. Although educating the primary health care providers on approaches to eliminate or at least reduce risk factors such as smoking and alcohol consumption.

Secondary prevention is the approach that concentrates on early detection of the disease (Screening). In oral cancer, this approach is preformed via routine clinical and oral examination for high risk patients (Smokers, >40 years, Alcohol, Poor Diet) as general public screening in oral cancer is not cost effective.

Tertiary prevention is the approach that focuses on reducing recurrence of the treated disease or minimizes treatment morbidity.

Recommendations for Early Detection and Prevention for Head and Neck

Primary Prevention:

- Cancer prevention is highly recommended by avoiding tobacco products by smoking or chewing.
- Avoiding alcoholic drinks.

Early Detection:
- No method was proven efficacious in early detection of oral cavity cancers.
- Good clinical exams for high-risk patients; smokers older than 40 years, alcohol consumption and poor nutrition.

References

1. *Jemal A, Murray T, Samuels A, et al: Cancer statistics, 1999. CA Cancer J Clin 53:5,2003.*
2. *Canadian cancer statistics 2004.*

3. *Cancer Incidence Report, Saudi Arabia, 2002. National Cancer Institute.*
4. *Shah JP. Head and neck surgery, 2nd ed. London: Mosby-Wolfe, 1996: 189-196*
5. *Magnano M, De Stefani A, Lerda W, Usai A, Ragona R, Bussi M, Cortesina G. Prognostic factors of cervical lymph node metastasis in head and neck squamous cell carcinoma. Tumori. 1997 Nov-Dec;83(6):922-6.*
6. *Magnano M, Bongioannini G, Lerda W, Canale G, Tondolo E, Bona M, Viora L, Gabini A, Gabriele P. Lymphnode metastasis in head and neck squamous cells carcinoma: multivariate analysis of prognostic variables. J Exp Clin Cancer Res. 1999 Mar;18(1):79-83*
7. *Pernot M, Hoffstetter S, Peiffert D, Aletti P, Lapeyre M, Marchal C, Luporsi E, Bey P, Nancy VL. Role of interstitial brachytherapy in oral and oropharyngeal carcinoma: reflection of a series of 1344 patients treated at the time of initial presentation. Otolaryngol Head Neck Surg. 1996 Dec;115(6):519-26.*
8. *Jones AS. Prognosis in mouth cancer: tumor factors Eur J Cancer B Oral Oncol. 1994 Jan;30B(1):8-15.*
9. *Mamelle G, Pampurik J, Luboinski B, Lancar R, Lusinchi A, Bosq J. Lymph node prognostic factors in head and neck squamous cell carcinomas in patients with lymph node involvement. Am J Surg. 1994 Nov;168(5):494-8.*
10. *Olsen KD, Caruso M, Foote RL, Stanley RJ, Lewis JE, Buskirk SJ, Frassica DA, DeSanto LW, O'Fallon WM, Hoverman VR Primary head and neck cancer. Histopathologic predictors of recurrence after neck dissection. . Arch Otolaryngol Head Neck Surg. 1994 Dec;120(12):1370-4.*
11. *Shah JP, Cendon RA, Farr HW, Strong EW. Carcinoma of the oral cavity. factors affecting treatment failure at the primary site and neck. Am J Surg. 1976 Oct;132(4):504-7.*