

The Role of the General Dental Practitioner in Detection and Prevention of Oral Cancer: A Review of the Literature

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Abstract: Over the last two decades little progress appears to have been made in reducing the incidence and number of deaths associated with oral cancer. The most recently available Scottish data indicate a steady rise in both incidence of, and mortality rates from, tongue and 'mouth' cancer, supporting previous observations of a steady rise in the incidence of oral cancer since the mid 1970s. Very little improvement in 5-year survival rates for oral cancer has been observed in England and Wales and, over the last 30 years, survival rates in Scotland have actually declined. Although many dentists are committed to examining the mouth for oral cancer, the majority still feel uncomfortable with involvement in patient education. Clearly scope exists for dental practitioners to improve patient awareness of both oral cancer itself and the risk factors associated with the disease. Dental teams should be aware of the opportunities within dental practice to contribute to preventive initiatives – such as smoking cessation.

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Clinical Relevance: The general dental practitioner, with regular patient contact, has the opportunity both to examine the mouth for oral cancer and potentially malignant lesions and to advise patients on the risk factors associated with the disease.

The role of the general dental practitioner in the prevention and detection of oral cancer has been clearly established,¹⁻³ and recent evidence suggests that most practitioners do carry out regular examinations for oral cancer in patients aged 16 and over, within the course of the normal 6-monthly dental check-up.⁴

For the purposes of this review, the

term oral cancer will be used to refer to squamous cell carcinoma. The World Health Organization International Classification of Diseases (ICD) Version 9 site codes are used.⁵

The incidence of oral cancer, notably for sites involving the tongue (ICD-9, 141) and 'mouth' (ICD-9, 143-145), continued to rise steadily throughout the 1990s, despite extensive knowledge of the risk factors associated with the disease.⁶⁻⁸

For England and Wales during the period 1980-1992, European age-standardized incidence rates for sites ICD-9, 140-149, ranged from 7.7 to 8.6 per 100,000 (males) and 3.3 to 3.7 per 100,000 (females).⁹ In Scotland, incidence rates were much higher than those recorded in England, male incidence rates ranging from 11.1 to 14.2 during the same time period, with

the comparable range for females being 4.6 to 5.6 per 100,000.¹⁰

Scottish incidence and mortality trends for cancers of the tongue and 'mouth' over the period 1980-1995 reveal worrying increases in both the number of reported cases and deaths recorded for all sites.¹⁰ A 60% rise in annual reported cases (from 65 to 108) was observed for cancers of the tongue, accompanied by a corresponding 64% increase in recorded deaths. For cancer of the 'mouth' reported cases doubled, from 100 in 1980 to 201 in 1995, with a corresponding 69% rise in deaths (Figure 1). This trend is of particular concern for males, and supports previous observations of increasing incidence in these cancers since the 1970s.⁶⁻⁸

Survival from oral cancer continues to be disappointingly poor. English cancer registries reported a small overall improvement in 5-year relative survival rates between 1971 and 1990, for cancer of the tongue: male rates rose from 32% to 36%, and female rates from 44% to 50%. For cancers of the 'mouth' observed during this period, both male and female 5-year survival rates rose, from 38% to 43% and 43% to 52%, respectively.⁹ The most recently available Scottish 5-year survival data (for the period 1971-1990) indicate a decline in survival for cancer of the tongue for both sexes, from 42% to 37% in men and from 45% to 41% in women. For cancer of the 'mouth' over the same period, male survival fell from 45% to 44% but female survival rose slightly, from 46% to 50%.¹⁰

Late diagnosis of oral cancer is

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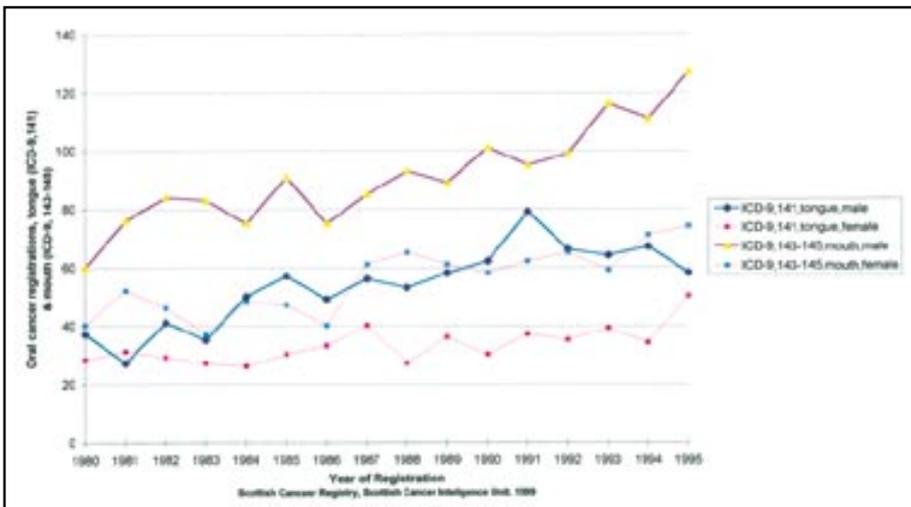


Figure 1. Trends in incidence of cancer of the tongue and mouth in Scotland, 1980–1995⁹

known to reduce the likelihood of successful treatment.^{11–13} Several factors (including failure by patients to present for regular oral examination and professional delay by medical or dental practitioners) may contribute to delayed diagnosis and referral of suspicious lesions. The painless nature of the lesions or, for edentulous patients, an inability to distinguish discomfort associated with dentures from that caused by cancerous lesions, may mean that patients do not seek timely professional advice.¹⁴

RISK FACTORS

Age

Prevalence of oral cancer increases with age: 98% of cases arising in the more industrialized nations are seen in people over the age of 40 years.¹⁵ However, recent rises in incidence have particularly been seen in younger age groups, and it should be appreciated that oral cancer can occur in either gender, at any age.

Environmental factors

It has been suggested that the disease is the result of a complex combination of interactions between host and

aetiological factors, producing a series of separate events from which carcinoma may eventually develop.^{16,17}

Tobacco smoking has been identified as the most important risk factor for oral cancer, with alcohol intake also contributing to increased risk of the disease. These are known to act synergistically,^{18,19} and together carry an attributable risk of 75–95%.² Alcohol may augment the activity of tobacco carcinogens by acting in several ways including as a solvent, thus allowing enhanced contact of carcinogens with the oral soft tissues.²⁰

Recent evidence indicates that good nutrition is protective against oral cancer,^{21,22} with iron deficiency contributing to oral mucosal atrophy and malignancy.²³

Viruses may have a role in the development of oral cancer and precancer,^{24,25} and infection with *Candida* is also believed to contribute to the aetiology of oral cancer.²⁶ However, research evidence for the role of these entities in the development of the disease is at present inconclusive.²⁷ Trauma and poor dental condition may also be involved in some way.²⁸

Oral cancer has been linked to social deprivation in the UK, with mortality rates from the disease in social class V being three times higher than those observed in social class I.²⁹ The

finding has been strengthened by examination of recent (1986–1995) Scottish data,¹⁰ using the Carstairs Deprivation Index. This indicates that men in the most deprived communities in Scotland (Decat 7) are three and a half times more likely to suffer from oral cancer than those in the most affluent areas (Decat 1) (Figure 2). Regular dental attendance is much lower in more deprived communities: only 32% in social classes IV and V reportedly attend for regular examination compared with 51% of adults in social classes I, II and III.³⁰

Premalignant Conditions

For a small proportion of lesions there is a recognized premalignant phase.

Detection and treatment at this stage, or at the early malignant phase, is associated with improved survival rates.^{12,16} Several conditions have been identified which contribute to an increased risk of oral cancer. These include:

- erythroplakia;
- leukoplakia;
- submucous fibrosis;
- certain variants of lichen planus.

Of less relevance today are syphilis and sideropenic dysphagia.

Erythroplakia

Erythroplakia has been described as ‘a chronic red mucosal macule which cannot be given another specific diagnostic name and cannot be attributed to traumatic, vascular or inflammatory causes’.³¹ The condition is often associated with smoking and excess intake of alcohol. A diagnosis of erythroplakia can be made only after exclusion of other possible causes such as trauma, candidal infection (including median rhomboid glossitis), mucositis, and benign migratory glossitis.

Microscopically, erythroplakia demonstrates a range of cellular atypia, and may present as carcinoma *in situ*, dysplasia or early invasive carcinoma. Erythroplakia may

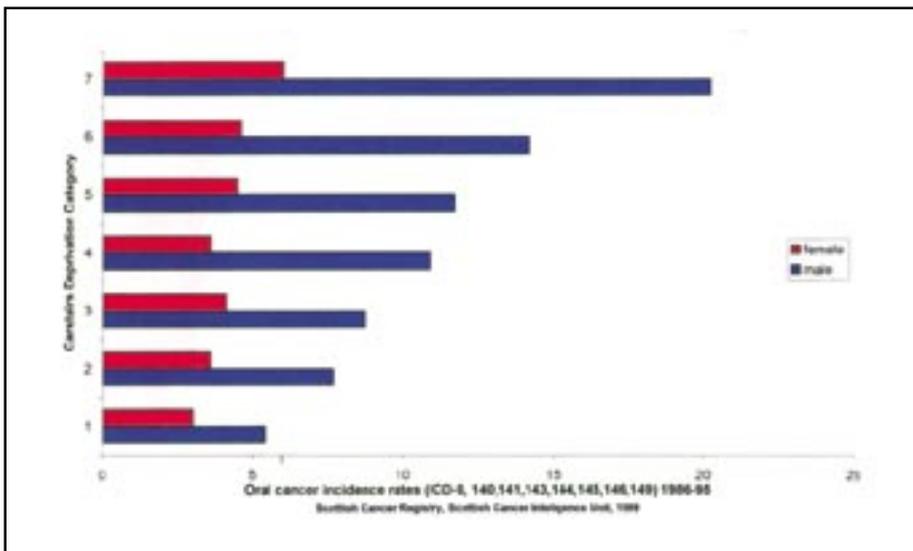


Figure 2. Age-standardized incidence rates of oral cancer per 100 000 person-years at risk by Carstairs Deprivation Category (1986-1995).¹⁰

constitute a greater risk of developing oral cancer than the more commonly observed leukoplakia.³¹

The lesions are most commonly found on the floor of the mouth, ventral surface of tongue or soft palate, and occur most frequently between 60 and 80 years of age.³²

Leukoplakia

Leukoplakia may be defined as ‘a morphologically altered tissue in which cancer is more likely to occur than in its apparently normal counterpart.’³³ It may be further defined as ‘a whitish patch or plaque that cannot be characterized clinically or histopathologically as any other disease, and is not associated with any physical or chemical causative agent except the use of tobacco.’³³

Histologically there are many subtypes, all displaying hyperkeratosis or hyperparakeratosis of variable degree. Epithelial dysplasia may or may not be present. The more dysplastic variety demonstrates greater potential for malignant transformation.^{33,34}

Although oral leukoplakia is more common than erythroplakia, it is less likely to undergo malignant transformation. In a review of the literature, Sciubba³⁵ presents the range of

malignant transformation of oral leukoplakia, from the 2.2% reported by Gupta *et al.*³⁶ to the 17.5% of Silverman.³⁷ Sciubba links the potential for malignant change to the degree of heterogeneity and dysplasia, and to site, with the floor of mouth and ventral surface of tongue constituting areas of highest risk.

Reduction in smoking activity has led to 4-8% annual regression of leukoplakia, even when complete smoking cessation is not achieved.³⁶

Oral Submucous Fibrosis

Oral submucous fibrosis is defined by the presence of fibrous bands within the oral mucosa, rigidity and limited movement of the oral tissues.¹⁷ The condition is associated with the chewing of betel and therefore may be of relevance to the oral health of people originating from the Indian subcontinent where betel chewing is more common.

Murti *et al.*³⁸ assessed the potential for malignant change in patients with oral submucous fibrosis and reported the development of oral cancer in 7.6% of cases over 17 years of continuous observation.

Lichen Planus

Lichen planus is an idiopathic

inflammatory condition, which may affect either the skin or the mucosa, or both areas simultaneously. Desquamative gingivitis may also be a presentation of lichen planus. Several variants have been observed in the oral mucosa.³⁹ Scully *et al.*⁴⁰ emphasize the need for regular monitoring of patients with lichen planus, particularly individuals with the atrophic variant, who may be at increased risk of malignant transformation. Lichen planus has a reported malignant transformation rate of 0.4-5.6%.⁴¹

PREVENTION OF ORAL CANCER

Primary prevention of oral cancer should focus on increasing patient awareness of the risk factors for the disease, placing particular emphasis on the role of smoking and alcohol. The inclusion of social history questions within the practice medical history questionnaire allows the practitioner to assess a patient’s smoking status and alcohol consumption, and to increase patient awareness of the link between smoking, alcohol use and oral cancer.

With substantial immigration to the UK from the Indian subcontinent, and the subsequent importing of cultural traditions such as tobacco or betel chewing, it is important for practitioners to be aware of the effect of such habits in the aetiology of oral cancer.

Smoking Cessation

There is encouraging evidence for the value of the dental team in persuading a patient to cease smoking. In a recent study, cessation rates of 11% were achieved by committed dental teams.⁴² Patients who smoke may be more receptive to advice on giving up smoking when the consultation occurs for a health problem related in some way to their habit.⁴³

Smoking is known to impact adversely on many aspects of oral health, increasing the risks of periodontal

disease and delayed wound healing.⁴⁴ Recent literature has provided useful guidance to practitioners interested in assisting patients to quit smoking.^{44,45} This involves a combination of four key elements.⁴⁶

Ask the Patients About Smoking

This will allow a practitioner to identify patients who may be contemplating quitting, and who may be receptive to advice on how to stop smoking successfully.

Advise Those Who Smoke to Stop

Clear advice to stop should be offered, and emphasis placed on the immediate and long-term benefits to oral and general health of quitting. The advice offered should be tailored as closely as possible to the patient's individual circumstances.

Assist Smokers to Stop

Nicotine replacement therapy has been found to be an effective adjunct to smoking cessation, with a 12% reduction in smoking amongst motivated patients when provided together with additional forms of support, even when this consists only of simple advice. To date, however, insufficient evidence of effectiveness has been reported for the use of such adjuncts as books and pamphlets, hypnosis and acupuncture.⁴⁷

At this stage, a quit date should be set, and the potential health benefits likely to be achieved should be emphasized. The patient should be made aware of local and national support networks.

Arrange Follow-up

It is important that patients should be reviewed to assess progress. This can normally be achieved at the next treatment appointment, usually one week later, when those patients who have lapsed may be offered further sources of support and encouragement.

Alcohol Moderation

Despite a wealth of information confirming the importance of alcohol

intake in the aetiology of oral cancer,⁴⁸⁻⁵⁰ a recent survey of Scottish dental practitioners⁴ has highlighted the lack of confidence that many respondents feel when discussing the subject of alcohol use with patients – only 3% of practitioners routinely enquire about this issue. The majority of those participating in this study felt the need for further training to improve confidence in this area.

The basic framework outlined above for aiding smoking cessation may be applied to the issue of sensible drinking.²⁷

- Ask about drinking habits, explaining the risks that alcohol consumption poses to oral health, particularly in people who smoke.
- Advise patients on the need to drink within sensible limits. Consumption should not exceed 3–4 units per day for men or 2–3 units per day for women. Patients with a history of suspicious lesions should be advised to abstain.
- Assist patients to comply with advice on sensible drinking by providing information. This is available through agencies such as health promotion departments.
- Arrange follow-up meetings to monitor progress and consider the need for referral to specialist agencies such as Alcoholics Anonymous.

EXAMINATION FOR ORAL CANCER

Regular examination for oral cancer should bring forward the stage at which the disease is detected, improving survival, simplifying treatment, and improving the quality of life for the patient.⁵¹

An examination for oral cancer should encompass the following:

- An extra-oral examination, with palpation of regional lymph nodes including the submental, submandibular, and deep cervical nodes.
- The skin of the lips should be

inspected for any areas of abnormality.

- An intra-oral examination, looking for lumps, ulcers, areas of induration or fixation, poor wound healing and oral conditions that predispose to oral cancer, such as leukoplakia and erythroplakia, oral submucous fibrosis, erosive lichen planus, and areas of chronic trauma. The examination should involve, in particular, the floor of the mouth, the tongue, buccal and lingual sulci, and the hard and soft palates.²⁷

CONCLUSION

The general dental practitioner with regular patient contact has the opportunity both to examine for oral cancer and precancer and to offer appropriate advice to patients on the risk factors associated with the disease. Although smokers and elderly patients can be considered to be at higher risk of developing oral cancer, the disease can occur at any age, and may affect non-smokers. Thus, examination of the oral mucosa should form part of a routine check-up for all patients. Many practitioners are already committed to this, despite the lack of a specific fee for this activity within the NHS fee determination.

It is important that dental practitioners, with high levels of awareness of the link between smoking and alcohol and oral disease, should contribute more actively to early *prevention* of oral cancer, and that postgraduate training should address the lack of confidence felt by many practitioners when discussing these issues with their patients.

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