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ORIGINAL ARTICLE

Effective management of smoking in an oral dysplasia clinic in London

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BACKGROUND: Precancerous lesions precede the development of oral cancer; of several clinical types the most common is leukoplakia. The risk factors include tobacco and excess alcohol use and diets low in antioxidants. Studies concerning the management of risk factors related to oral precancer are meager.

OBJECTIVES: We investigated the effectiveness of smoking cessation at a dysplasia clinic among patients followed up for at least for 12 months.

METHODS: Data from case notes relating to180 patients with white and red patches of oral mucosa (excluding other benign disorders confirmed by biopsy findings) attending a dysplasia clinic at a teaching hospital in London and seen by one consultant between 1993 and 2003 were transcribed. Effect of referring to a smoker's clinic to receive specialist help was evaluated against brief advice given at the dysplasia clinic ± medications.

RESULTS: The mean age at the first visit was 48.5 years (±12.5), 65% were male, and 88% were white European. One hundred and sixty-two patients (90%) had used tobacco and 83% were current smokers. Of the smokers 95% had smoked over 10 years, the majority smoking over 10 cigarettes per day. Nine were alcohol misusers including two binge drinkers. One hundred and forty-six were diagnosed with oral leukoplakia, 16 with non-homogeneous types (speckled or nodular). Three patients were diagnosed with an erythroplakia. Nineteen per cent exhibited the presence of dysplasia and one subject had *in situ* carcinoma. Five patients in the sample quit smoking prior to arrival in the dysplasia clinic. Twenty-seven cases (20%) with oral leukoplakia quit smoking while registered as a patient at the dysplasia clinic: 17 of 100 subjects quit with brief advice ± medications and 10 of 30 following referral to the smoker's clinic. The difference between the two groups was significant for point prevalence abstinence at the last visit to the clinic (minimum 12 months follow up). Out of a total of 180 precancer cases managed in the dysplasia clinic (mean follow up 4.2 years) three patients subsequently developed invasive carcinoma during follow up.

CONCLUSIONS: Smoking cessation needs to be an integral component of management of cases attending a dysplasia clinic and referring to smoker's clinics could help to improve the effectiveness of managing patients with oral precancer to quit smoking.

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Keywords: leukoplakia; precancer; risk factors; smoking; tobacco cessation

Introduction

A proportion of cancers of the oral cavity arise from pre-existing potentially malignant oral lesions and conditions. Oral leukoplakia is the most common precancerous lesion of the oral cavity. Patients with such lesions have been estimated to have a likelihood of developing carcinoma which is 50 to 100 times grater than that of the general population (Cawson, 1975). On biopsy some of these may exhibit epithelial dysplasia – one of the prognostic factors in risk assessment of oral precancers with reference to their probable malignant transformation (Speight *et al*, 1996; van der Waal *et al*, 1997; Warnakulasuriya, 2001). Major risk factors for oral epithelial dysplasia are smoking and excess alcohol consumption (Jaber *et al*, 1999), and these risks are shared by cases with oral squamous cell carcinoma (Blot *et al*, 1988). If untreated 10–15% of leukoplakias will develop into cancer over a period of time (Tradati *et al*, 1997) and the actual estimates could be population specific. In the industrialized countries the percentage of oral cancers that arise from pre-existing precancers is not entirely clear, but figures around 17–35% are quoted (van der Waal *et al*, 1997). The management of risk factors related to oral precancer has not been adequately researched. The objective of this study was to examine the risk factors among patients attending a dysplasia clinic in south London and to evaluate the outcomes for the intervention of tobacco habits in this clinic population.

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Materials and methods

A database maintained for all patients attending a dysplasia clinic at a London Teaching Hospital from 1993 to 2003 and seen by one consultant was the primary source of data for this study. All patients with persistent white and red patches of the oral mucosa consistent with a clinical diagnosis of leukoplakia or eythroplakia, were included in the study. Of the many oral lichen planus cases seen in the clinic over this period those with persistent symptoms because of recurrent ulceration or those which on biopsy had some features of dysplasia were also included. Other precancerous conditions included were diagnoses of discoid lupus erythematosus and oral submucous fibrosis. Diagnostic criteria for the clinical detection of oral leukoplakia and erythroplakia in this clinic were based on World Health Organization (WHO, 1978, 1980) and Malmo Conference criteria (Axell *et al*, 1984) and made by an Oral Medicine specialist calibrated to WHO standardized guidelines (WHO, 1980). Leukoplakia was defined as a predominantly white lesion that cannot to scraped off and cannot be categorized as any other lesion (WHO, 1978) and classified by its aetiology as caused by chronic tobacco use or of idiopathic origin (Axell *et al*, 1984). Based on morphological criteria leukoplakia lesions were classified as homogeneous or non-homogeneous (Axell *et al*, 1984). Erthroplakia was defined as a red lesion that cannot be characterized as any other known diagnostic entity. All leukoplakia and erythroplakia cases attending the clinic had a diagnostic biopsy performed to asses epithelial dysplasia. Patients included with all other diagnostic categories i.e. lichen planus, discoid lupus erythematosus and submucous fibrosis were also confirmed by biopsy with histological verification.

From the initial trawl of 404 cases in the database that included any persistent white or red patches several exclusions were made. Cases excluded were those with a likely diagnosis of frictional keratoses that were discharged to the care of the referring dentist and not followed up in the dysplasia clinic, those with totally benign lesions such as leukoedema, white sponge nevus or leukokeratosis nicotine palati (smoker's palate) and all asymptomatic lichen planus cases where the biopsy findings did not suggest any dysplasia and those who had no history of tobacco use. Any patient who had not been followed up at least 12 months from their first visit to the dysplasia clinic was also excluded from the analysis.

The clinic notes of eligible patients were consulted to verify any missing information in the database. A pilot study was undertaken to verify the compatibility of data files (Yaraghi and Warnakulasuriya, 2003). Demographic data such as age, gender, ethnicity and the patients' self reported histories on tobacco, alcohol, betel quid (areca nut) use at first visit, attempts to quit smoking were transcribed from clinic notes. Clinical and pathology records were verified to confirm the entries.

Brief advice on tobacco cessation (using the 5As model, Fiore *et al*, 2000) was given to all smokers attending the clinic by the specialist clinician in a systematic manner. Where appropriate, smokers were advised to request help from their GP or a pharmacist to obtain nicotine replacement therapy (NRT) in order to help their quit attempt. As routine practice smokers consuming over 10 cigarettes a day/smoking in the first hour of waking were referred to a nearby specialist smoker's clinic for intensive tobacco treatment and all patients in this smoking category had an equal chance of receiving the intervention package. These referred smokers were flagged and the database at the smokers' clinic were verified for their attendance and quitters were identified from available records. Medical and behavioural support was also provided to regular alcohol drinkers consuming excess of recommended levels of alcohol by referral to the Outpatient Substance Misuse Clinic located within the hospital.

All data were entered on an excel spread sheet converted to SPSS (Version 10) (SPSS Inc., Chicago, IL, USA) and any association between categorical variables and tobacco use and cessation was tested by χ^2-test (percentages) or *t*-tests (means).

Results

One hundred and eighty subjects with a confirmed precancerous lesion or condition were eligible for this study. All subjects were residents of south London and had been referred by either their dentists (82%), physicians (6%) or from another hospital unit (12%) for the management of oral precancer. Sixty-five per cent were male patients and the age range of the cohort was between 24 and 88 years (mean 48.5 years) at their first visit. The majority of the patients was white European (88%). Mean follow up period was 4.2 years.

The tobacco habits of the study population are listed in Table 1. One hundred and sixty-two patients (90%) had ever used tobacco in the form of manufactured cigarettes, hand made roll ups, in smoked pipes or as chewing tobacco or as any combination of these products. Eighteen (10%) were never smokers. Eighty-three per cent were current users of tobacco at the time of first attendance. Of the smokers, 95% had smoked over 10 years, the majority smoking over 10 cigarettes per day. Thirty per cent were categorized as current alcohol drinkers (taking alcohol on several days in the preceding week of the consultation) and an additional 10% were occasional drinkers. A small proportion were binge drinkers (2%) and seven (4%) reported alcohol misuse all of whom referred to the Alcohol clinic (data not shown). Seven were regular chewers of betel quid containing areca nut.

Table 1 Reported tobacco use of the patients diagnosed with oral precancer ($n = 180$)

Ever using tobacco	162
Past tobacco users	13
Number giving up tobacco before arrival in clinic	5
Current tobacco users at first visit to the clinic	144

Table 2 Oral lesions diagnosed and dysplasia status

	Total (n)	*With dysplasia, n (%)*	*Smoker*	*Other tobacco*	*Exsmoker*	*Never used tobacco*
Oral leukoplakia	146	24 (16)	130[b]	2	11	3
Erythroplakia	3	3 (100)	3			0
Discoid lupus Erythematosus	6	0	2			4
Oral submucous fibrosis	10	4 (40)	5	5		0
Lichen planus[a]	15	3 (20)	2		2	11
All	180	34 (19)	142 (79)	7(4)	13 (9)	18(10)

[a]Only selected cases with persistent symptoms needing follow up were included.
[b]Of this group five had given up smoking on arrival.

The primary clinical diagnoses for the case-series are listed in Table 2. The large majority were diagnosed with leukoplakia ($n = 146$) by the attending consultant and among these cases non-homogeneous appearance (speckled, nodular or verrucous) was limited to 16 cases. Only three erythroplakias were seen during the period. All submucous fibrosis ($n = 10$) cases were among Asian subjects.

Among leukoplakia cases 24 (16%) and among erythroplakia all three had been diagnosed with oral dysplasia and one of them with carcinoma *in situ*. There were three cases with epithelial dysplasia recorded among the selected lichen planus cases (Table 2).

Tobacco habits associated with individual precancer cases are also shown in Table 2. Among leukoplakia cases ($n = 146$) 130 had current/recent tobacco habits (five out of 130 having given up tobacco before arrival in the clinic), 11 were past (ex) tobacco users and three had no reported tobacco habits suggesting the oral keratosis that was investigated was idiopathic in origin.

Five (4%) had given up their tobacco habit after the detection of their white or red patch by a dentist or a physician before arriving in the dysplasia clinic. They were all light smokers consuming < 10 cigarettes per day or equivalent amount of tobacco. Following brief advice and while attending the dysplasia clinic for review of oral lesions and conditions 17 subjects quit tobacco use. This group included those smoking < 10 cigarettes a day or those unwilling to attend the smoker's clinic. Fifty-five were referred to the smoker's clinic for counselling and help and among 30 who attended, 10 successfully quit tobacco use. The difference between these two groups was significant ($P < 0.05$) for point prevalence abstinence at the last visit to the clinic (minimum 12 months follow up). Followed over a minimum 12-month period among leukoplakia cases ($n = 130$) 27 subjects (20%) who reported tobacco use at the first visit to the dysplasia clinic gave up tobacco use (Table 3). Among the demographic variables examined the age of subjects (older than 45 years of age) and trying to stop smoking in the past 12 months were positively associated with success of quit attempts. Compliance of ethnic minority subjects to attend the smoker's clinic was poor and significantly lower than that of white European patients ($P < 0.05$). The numbers of smokers in the groups with lesions other than leukoplakia were too small to assess whether clinical diagnoses affected the likelihood of quitting.

Table 3 Quit rate among oral leukoplakia cases

	smokers	*No quitting*	*Quit rate*
On advice from primary care physician/dentist before attending dysplasia clinic	130	5	3.8
Brief advice only + nicotine replacement therapy	100	17	17
Following attending the smokers clinic	30	10	33

Three patients attending the dysplasia clinic were subsequently diagnosed with a malignant transformation. The first, diagnosed with erythroplakia (biopsy, carcinoma situ) had on rebiopsy 2 weeks later, confirmation of a squamous cell carcinoma suggesting a sampling error in the first biopsy. This patient's social history included 30 years of pipe smoking and 16 units of alcohol per week. The second was a case of leukoplakia with no dysplasia who had smoked 40 years at one pack per day. This patient did not stop smoking while attending the clinic and transformed 2.4 years after her initial biopsy. The third was a case of ulcerative oral lichen planus (no dysplasia in biopsy) who neither smoked nor drank alcohol, had attended this clinic for 7 years for follow up. Her lichen planus was widespread and developed a squamous cell carcinoma on the lower alveolar mucosa and was detected at the T1 stage.

Discussion

Oral precancerous diseases are well characterized – a few of these may transform to cancer over 1–10 years with an annual transformation rate of about 1% (Johnson *et al*, 1996). Several surgical treatment approaches have been tested for oral leukoplakia and two European studies suggest that their outcome cannot be influenced by surgical excision or carbon dioxide laser surgery alone (Chiesa *et al*, 1990; Schepman *et al*, 1998). A later study with CO_2 laser surgery reported good prophylaxis, with 10% local recurrences and 1% developing cancer over a mean one year period (van der Hem *et al*. 2005). Among European subjects tobacco smoking is the major risk factor for oral leukoplakia (Kulasegaram *et al*, 1995; Jaber *et al*, 1999). Despite this information being available in the public domain there is no unified approach to provide interventions to this group of high-risk patients. As tobacco is the major risk factor, then it

might be hypothesized that reducing or stopping tobacco use would result in lowering the risk of disease progression. Clinic-based estimates of health professional intervention for tobacco use are not available for this disorder.

This study was undertaken on a clinic population who at their initial examination and during follow up visits were provided with either brief or an intensive behavioural intervention programme as appropriate with a view to educating and counselling them to stop their tobacco habits. In the dysplasia clinic advice given to subjects was based on the 5A model recommended for such clinical settings (Fiore *et al*, 2000). Where appropriate further support was also available through a smoker's clinic, an approach that has not been reported in the dental literature. All patients smoking over 10 cigarettes a day/smoking in the first hour of waking, had an equal chance of receiving the intervention package. We estimated by inquiry at follow up, that 20% of the clinic population with leukoplakia quit smoking following health advice. This compares well with other intervention programmes reported globally (Fiore *et al*, 2000) and the outcome appears marginally better than what has so far been achieved in other dental settings (Warnakulasuriya, 2002). Seventeen trials on interventions of smoking during hospitalized treatment were reported in a recent Cochrane review (Rigotti *et al*, 2004). Intensive intervention (inpatient contact plus follow-up for at least 1 month) was associated with a significantly higher quit rate compared with control (OR 1.82, 95% CI 1.49–2.22, six trials). In one study (Molyneux *et al*. 2003) among medical and surgical in patients 37–55% (depending on intensity of therapy) reported successful quitting during their period of stay in the hospital. It is unlikely that out-patient clinics will reach such targets as in-patients have restrictions to use tobacco while being hospitalized and their follow up period is shorter.

While short term success rates of quitting among smokers who seek help can reach 70% within 4 weeks of entering a smoking cessation programme, after 1 year continuous abstinence rates may fall to around 20% (Sutherland, 2003). The results of the study reported here compare favourably with national data from smoking cessation programmes and the clinic rates were higher than rates reported by self-quitters (Hughes *et al*, 1992). Advice to continue NRT use up to 6 months may help to boost success by reducing relapse for most dependent smokers with tobacco-associated diseases. Routine reinforcement to remain an ex smoker (by praise and complementing) during follow up help in reducing relapse (West *et al*, 2001) should be offered at every follow up visit to the dysplasia clinic. The data show that not every smoker with precancer is dependant and education and motivation also can help some smokers. Only some need intensive treatment, particularly the heavily dependent smokers. The practical guidelines to help clinicians managing smoking associated precancers to control oral cancer are reviewed elsewhere (Warnakulasuriya *et al*. 2005). Over two decades ago, the outcome of intervention by brief advice for smokers with oral leukoplakia in Sweden was reported (Roed-Petersen, 1981) but no referrals were made to a specialist clinic for quitting. In the small group of subjects who attended the smokers' clinic in our study the quit rate was significantly higher than those who received brief interventions, despite the fact that only heavily dependent smokers were referred to the special clinic. Additional effects of medication (NRT or Zyban®) with intensive treatment (weekly group sessions for 6 weeks plus encouragement from a counsellor), and personal support from a 'buddy' (who is another member of the group trying to quit at the same time), could be expected to achieve three times the quit rate achieved by brief advice alone (Sutherland, 2003). Use of this kind of resource (Hajek and West, 1998) has not been documented for management of oral precancer in any clinic based study although medical and surgical clinics are researching this utility (Molyneux *et al*, 2003). Tobacco intervention using a population based approach for Indians at high risk of oral leukoplakia was reported by Gupta *et al* (1995). 6.5% of their tobacco users reported quitting following that approach and a substantial drop in incidence of leukoplakia was reported over a 10-year follow up period. Management of oral leukoplakia by oral medicine, maxillofacial and ENT specialists in the UK was audited by Marley *et al* (1996, 1998). There was little discussion about the overall management of risk factors i.e. tobacco cessation in the clinics managed by these specialists.

Auditing smoking cessation approaches and other suitable interventions of risk habits in people with oral precancer may help us to understand the prevailing barriers in hospital settings. Physician/surgeon education to provide brief smoking cessation advice may help in the reduction of barriers to undertake this activity. These efforts need to continue so that opportunities to reduce mortality and the health costs related to oral cancer are not lost (Warnakulasuriya *et al*, 2005).

Randomized control trials on the management of oral leukoplakia are meagre (Lodi *et al*, 2002). Effectiveness of medical and surgical interventions together with the help to quit smoking need further study. People with potentially malignant oral lesions need support to give up their risk habits, as continuation of risk habits may increase their risk to develop cancer. Specialist smokers clinics can be both effective and cost effective (Hajek and West, 1998) and their utility to help patients with oral dysplasia diagnosed in oral medicine, maxillofacial and ENT clinics should be further explored in experimental settings.

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