

Educational aspects of oral cancer

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Key points

Summarises the education of oral and oropharyngeal cancer to dental students and other pre-registration dental care professionals.

Argues these levels of education must be maintained to ensure ability to undertake relevant CPD post registration.

Emphasises that early detection of oral and oropharyngeal cancer and delivering appropriate preventive advice saves lives.

The incidence of oral and oropharyngeal cancer is rising in the UK, its aetiology is changing and early detection and referral saves lives. This article covers how and to what depth oral and oropharyngeal cancer is taught to dental students and other preregistration dental care professionals and examines the threats in the current climate to that education. It also discusses the knowledge of oral and oropharyngeal cancer among general dental practitioners and argues that further continuing professional development regarding the changing aetiology and epidemiology of oral and oropharyngeal cancer is desirable. The article concludes that current levels of education before registration must be maintained so that dentists and dental care professionals can take full advantage of continuing professional development and are able to detect oral and oropharyngeal cancer, refer for specialist treatment and provide appropriate preventive advice to their patients. In this way the potential of all dental professionals to save lives will be maintained.

Introduction

Oral cancer refers to malignant neoplasms of the oral cavity, of which the overwhelming majority are squamous cell carcinomas arising from the mucosal epithelium. The oral cavity comprises the cheeks, lips, buccal mucosa, hard palate, floor of mouth, gingivae and anterior two-thirds of tongue. Cancers arising at these sites are known as oral cancer (OC). However, cancers may arise at other sites which are accessible to examination, including the tonsils, posterior third of the tongue and the soft palate and are referred to as oropharyngeal cancer (OPC).

Detailed cancer statistics are provided by Cancer Research UK, who assimilate data from the four UK cancer registries on their website.¹ The latest data suggest that there are about 7,800 cases of OC and OPC per year in the UK and that there has been an increase of about 30%

since the 1990s, particularly in younger age groups and in women, although increases in most age groups and in men are also evident.¹

The risk factors associated with OC and OPC are well known and include smoking, alcohol, betel quid chewing, smokeless tobacco and infection with high risk subtypes (16 and 18) of human papilloma virus (HPV). HPV is particularly associated with cancers arising in the oropharynx (rather than the oral cavity) and has seen three-fold rises in the USA and Western Europe since the late 1980s.² It has been estimated that cases of HPV-related oropharyngeal cancers will soon overtake HPV associated cervical cancers.^{2,3}

There is increasing evidence that early detection and referral of patients with OC and OPC can save lives and reduce the morbidity of treatment. Patients with Stage I and II lesions have a greater survival than patients with Stage III or IV disease.⁴ Thus, it is important that healthcare professionals who may be the first point of contact for patients, are aware not only of what the normal oral cavity looks like but also the changes indicative of OC and OPC and potentially malignant disorders. These healthcare professionals include dentists, therapists, hygienists, clinical dental technicians and general medical practitioners (GMPs). Of these groups the

greatest number of patients is likely to be seen by the dentists and GMPs, although with the recent advent of direct access other dental care professionals (DCPs) will have a greater role in early detection and referral of suspicious lesions. All these groups of healthcare professionals should be taught how to examine the oral cavity and oropharynx and how to recognise malignant lesions and their precursors. They should also have at least a basic understanding of the aetiology and pathogenesis and how this underpins the clinical presentation and management of these diseases. Dentists should have a deeper level of understanding of the aetiology and pathogenesis and in addition, have knowledge of the epidemiology, behaviour, and long-term management of such diseases. They must also know how, when and to whom they should refer such patients and how they should deliver preventive advice.

The General Dental Council regulates the dental profession in the UK and they also set the minimum levels of educational attainment that must be met before any member of the dental team can be registered to practise as a dental professional. The GDC document, *Preparing for Practice. Dental team learning outcomes for registration*,⁵ describes the outcomes in terms of skills and knowledge, that an individual

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Table 1 Outcomes relevant to oral cancer which must be met prior to registration with the General Dental Council

Dentists	Hygienists & therapists	Clinical dental technicians	Dental nurses
1.12.3 Identify all stages of malignancy, the aetiology and development of tumours and the importance of early referral for investigation and biopsy			
1.1.3 Identify oral diseases and explain their relevance to prevention, diagnosis and treatment	1.1.2 Describe oral diseases and their relevance to prevention, diagnosis and treatment		
1.1.5 Explain the aetiology and pathogenesis of oral disease	1.1.4 Explain the aetiology and pathogenesis of oral disease	1.1.4 Explain the aetiology and pathogenesis of oral disease	
1.12.2 Identify oral mucosal diseases and refer where appropriate			
	1.2.4 Recognise abnormalities of the oral cavity and the rest of the patient and raise concerns where appropriate	1.1.3 and 1.6.5 Recognise abnormalities of the oral cavity and the rest of the patient and raise concerns where appropriate	1.1.3 Recognise abnormalities of the oral cavity and the rest of the patient and raise concerns where appropriate
1.2.1 Recognise the importance of and carry out an appropriate systematic intra- and extra-oral clinical examination	1.3.2 Undertake an appropriate systematic intra and extra-oral clinical examination	1.2.1 Recognise the importance of and carry out an appropriate systematic intra and extra-oral clinical examination	

must be able to demonstrate by the end of their training. However, the outcomes do not use the words OC or OPC and educational outcomes in this area of clinical practice are only stipulated implicitly, but not explicitly (Table 1).

There is a specific GDC outcome relating to malignancy for dental students and although trainee hygienists and therapists have similar outcomes to dental students, malignancy is not specifically mentioned. Hygienists and therapists are only required to describe oral diseases, but not to identify them. They are, however, required to ‘recognise abnormalities’ of the oral cavity and raise concerns where appropriate as are clinical dental technicians and dental nurses. To meet this outcome, it would be expected that DCPs must learn the full range of abnormalities, including OC and OPC, and will be taught not only how to ‘raise concerns’, but also how to formally refer to an appropriate specialist. With regard to training for medical practitioners, neither OC, OPC nor the oral cavity are mentioned in the General Medical Council outcomes although registrants are required to be able to perform a full physical examination (which presumably would include examination of the mouth) and make a diagnosis or differential diagnosis based on a full assessment of the patient’s problems.⁶

The outcomes shown in Table 1 are very broad and although they could all apply to OC and OPC, the GDC do not indicate what level of detail is required. It is the responsibility of the educational provider to decide on the content and depth of knowledge provided in the training curriculum. For undergraduate dental students in the UK, the educational providers are the universities who train to

degree level. However, clinical training and exposure to patients who may have OC or OPC is provided by associated NHS trusts, often within a dental hospital. Hygienists, therapists and clinical dental technicians may be trained within universities or wholly within the NHS, and may receive diplomas or degrees from a local accrediting university or from one of the Royal Colleges. These educational providers are required to interpret the outcomes of the GDC and ensure that the registrants are compliant.

Pre-registration teaching and learning of OC and OPC

Many educational providers depend on the expertise, experience and judgement of their staff for guidance on the actual content of their curriculum which is usually carried out by the specialties of oral pathology, oral medicine and oral surgery or oral and maxillofacial surgery. This may vary between educational providers depending on the nature of the curriculum and staff availability – for example ear, nose and throat specialists teach medical students in some medical schools.⁷

There are some guidelines provided by the specialist societies to inform curriculum development. The teaching groups of both the British Society for Oral and Maxillofacial Pathology (BSOMP) and the Association of British Academic Oral and Maxillofacial Surgeons (ABAOMS) have produced core curricula for dental undergraduates^{8,9} and the Quality Assurance Agency for Higher Education in the UK has produced guidelines for all DCPs.¹⁰ Further guidelines are available through the

Association for Dental Education in Europe (ADEE): The Graduating European Dentist,^{11–14} but while they mention mucosal disease there is no specific mention of OC or OPC.

The BSOMP and ABAOMS recommend that dental students should have knowledge of and understand the epidemiology, aetiology, pathogenesis, behaviour, histopathological changes and management of lesions and disorders with malignant potential (potentially malignant disorders) and ‘oral cancer’. In addition, they should be competent at recognising the clinical features and should be able to refer patients to secondary care as well as being able to effectively counsel patients on cancer prevention including smoking cessation.^{8,9} However, these guidelines are over ten years old and need to be revised to include, for example, current knowledge of OPC and HPV.

The BSOMP teachers group recently undertook a review of oral pathology teaching in the UK dental schools and found that teaching was integrated with oral medicine and oral surgery in twelve out of sixteen schools, with many joint lectures or symposia showing that teaching about OC and OPC is integrated between disciplines. In the remaining four schools, two had problem-based or evidence-based learning and the remaining two had standalone oral pathology courses suggesting that the different aspects of OC and OPC teaching are taught separately. Most OC and OPC teaching takes place in the fourth and fifth years of the undergraduate course although in some schools it is introduced as early as Year 1.

Only seven schools still teach histopathology in a practical class format, four using virtual

microscopy, two using microscopes and one using photomicrographs. Virtual microscopy is a method of teaching of histology and histopathology which involves scanning microscope slides and making the images available in an online learning environment where they can be accessed by the students. In Sheffield¹⁵ and some other schools, teaching of the pathology (including aetiology and pathogenesis) of OC and OPC is integrated with learning about the clinical features, differential diagnosis and management of the patient. In this way the students understand how the changes which take place in the tissues relate to the clinical features of the disease and how the pathogenesis relates to the clinical behaviour of the cancer and informs the management. They also understand how the aetiology of OC and OPC relates directly to the clinical history. We feel this is important because a basic understanding of the pathology and causes of disease is essential for accurate diagnosis and appropriate management as well as providing a sound basis for continuing professional development.

In addition to learning about the disease, dental students in the majority of dental schools attend clinics in both oral medicine and oral surgery/oral and maxillofacial surgery where they may directly observe the management of patients with OC and OPC. Only if they are fortuitous will they see a patient at first presentation, because the disease is relatively rare. More likely is that they will see a patient who has been treated for OC or OPC and is under review or see a patient with potentially malignant disorders including homogenous or non-homogenous leukoplakia. It is important that students not only recognise the clinical features of OC and OPC but they understand the importance of a thorough patient examination as well as taking a clinical and social history to determine whether the patient has high risk habits.

Some students have the opportunity to attend theatre during a cancer operation and others may attend the multidisciplinary team meetings (MDT or MDM) where the appropriate management of patients with OC and OPC is discussed. At a MDT, they will observe the multidisciplinary aspects of OC and OPC management and will be able to listen to the opinions of a wide range of professionals including pathologists, oncologists, surgeons, radiologists, specialist cancer nurses, restorative dentists, speech therapists and nutritionists. Some students have the opportunity to attend pathology laboratories where they can observe how cancer resection specimens are prepared and see how a detailed pathology report

is generated. Seeing this is an important part of understanding patient management because the staging of the cancer may be modified depending on the pathological findings and this may alter future management. Furthermore, they will have improved understanding of how to interpret a pathology report. Thus students are exposed not only to the theoretical aspects of OC and OPC but also to the clinical features and management of real patients.

Effective communication is an essential part of patient management. Patients may ask their dentist about OC and OPC, its aetiology and what they (the patient) can do to prevent it. Thus, students must have a detailed knowledge of the aetiology of OC and OPC including smoking, drinking, betel quid chewing, diet and the role of HPV infection, and must learn to convey that information to the patient in an understandable, sympathetic and non-judgemental way. They must also learn how to communicate with a patient whom they suspect may have OC or OPC and who they wish to refer to secondary care. Communication skills are widely taught in our dental schools, and are an essential part of undergraduate dental education. Students are taught how to give prevention advice to patients particularly in the form of dietary advice, smoking and alcohol cessation. Given the recent rise in the incidence of HPV and increasing patient awareness of infection as a risk factor in OPC, it is essential that this is also covered in undergraduate courses.

The standards of teaching and learning in all dental schools are moderated by external examiners who visit the examinations and have the opportunity to assess the students' knowledge and clinical skills. One of the parameters they are asked to comment on is whether the standard of the students being examined is comparable to that of other institutions. This is important because it ensures that any major deficits will be picked up and reported upon. In our experience the standards for dental undergraduates across schools visited are high and comparable in terms of OC and OPC knowledge.

One area where there may be room for improvement is in how dentists refer patients with suspected OC or OPC. A recent study carried out on behalf of the Dental Schools Council on preparedness for practice found that many final year dental students felt they lacked the ability to confidently refer patients with OC and OPC.¹⁶ In contrast, a survey of foundation year trainers showed that 75% felt that recent graduates were able to manage mucosal disease.¹⁷ Thus, there is a discrepancy between

students' perceptions of their ability and those of their trainers immediately post-graduation. One possible explanation of the difference may be what students interpret as 'confidently refer'. A final year student will have limited exposure to patients with OC and OPC and although they may have detailed knowledge on how to refer they will never have done it in a real life situation. They may not therefore feel confident about doing so even though they may know how to do it. Clearly, however, there is the need for further research in this area.

There is very little published information available on teaching of OC or OPC to hygiene and therapy students in the UK. In some schools they are taught alongside dental students for the theoretical aspects of OC and OPC teaching and attend oral medicine and/or oral surgery clinics. In addition, students learn communication skills and preventive advice in terms of smoking cessation. All examinations are visited by external examiners and they are required to comment on whether standards are comparable between institutions. There is evidence that the ability of hygienists and therapists to differentiate between OC, potentially malignant disorders and benign lesions is similar to that of primary care dentists¹⁸ suggesting that either they have retained the knowledge from their pre-registration teaching or they have taken advantage of continuing professional development (CPD).

There is a similar paucity of information regarding provision of OC or OPC teaching in UK medical schools. One study has shown the time devoted to teaching oral health (including 'oral cancer') varies from one hour in one school to a four to five week course in two medical schools. While the risk factors were taught by a majority of schools only about half taught the range of clinical appearance of OC or OPC.⁷ Thus, there appears to be variability in teaching provision of OC and OPC across UK medical schools. This appears to reflect the findings from other studies which have shown that dental students far out-perform medical students in terms of recognition of the clinical changes associated with OC or OPC as well as knowledge of the aetiology and whether they would give preventive advice. This relative lack of knowledge may reflect the fact that up to 40% of medical students reported that they had never had the opportunity to examine the oral cavity of a patient with oral lesions.¹⁹ This is worrisome given there is evidence that elderly patients with OC are more likely to visit their GMP rather than their GDP for advice.²⁰ Clearly, there is a need for further education among medical students.

Continuing professional development in OC and OPC

Once students qualify and register with the GDC most undergo foundation training before entering general dental practice. Some will go on to work in a hospital setting and undergo higher specialist training and others will go into the community. Upon registration, dentists are characterised as safe beginners and will increase their clinical experience as they begin to develop into more skilled and competent dentists. For the majority of dentists and indeed other dental healthcare professionals, it seems likely that their knowledge of OC and OPC is greatest at graduation and without continuing professional development that knowledge will decline as their clinical exposure to OC and OPC and reinforcement of the essential features of recognition and referral will not be present in general dental practice. Indeed, the curriculum for newly qualified dentists undergoing foundation training does not mention OC or OPC specifically, although it does state that they should be able to recognise oral disease and be able to refer onwards and also be able to explain the risks associated with alcohol and smoking.²¹

Life-long learning or CPD is now mandatory for dentists and DCPs and for doctors who are also required to undergo revalidation. Since 2012, CPD in early detection of 'oral cancer' has been added to the list of recommended topics for all dental professionals.²² There is, however, evidence to suggest that knowledge among dentists and DCPs is variable¹⁸ and there are barriers in general dental practice to detection and referral.²³ Furthermore, the epidemiology and risk factors associated with OC and OPC are changing and without the relevant CPD in that area dentists and DCPs will not be able to take an adequate history in terms of risk factors to identify high risk patients. Furthermore, they will not be able to impart relevant preventive advice or discuss the aetiology, particularly in the area of HPV infection. This is worrisome and careful thought should be given by providers of CPD as to how this should be addressed.

Relevant to this, it is also important to stress that any reduction in the amount of teaching in OC and OPC to dental undergraduates should be avoided. Currently, there are many threats to the teaching of oral pathology, oral surgery and oral medicine as well as basic biological principles which underpin the understanding of disease, in new curricula being developed across the UK. In particular, there is the perception that

dentists do not need to understand the diseases they treat, merely know how to recognise and manage them and there is much emphasis on developing practical skills before registration. Recent implicit criticism by Health Education England²⁴ has suggested that increased training in so called 'soft skills' has been at the expense of practical skills. We would argue that practical skills can be further developed and enhanced in new graduates in foundation training and under the guidance of experienced employers. Conversely, foundation trainers and GDPs are unable to impart the necessary knowledge or skills on OC or OPC. Furthermore, the GDC outcomes state 'the qualification for registration only represents the first stage in the development of the dental professional, and education and training must prepare students to carry out reflective practice and self-directed learning to keep their knowledge and skills up to date throughout their professional lives and adhere to any regulatory requirements regarding lifelong learning, CPD and revalidation.'⁵ This is a strong argument to maintain if not to extend the level of teaching of OC and OPC (and other oral diseases) and the aetiological and biological principles which underpin them in the undergraduate curriculum. Failure to do so will impact on the ability of GDPs in the future to properly care for their patients in the broadest sense and reduce their ability to undertake and understand relevant CPD. Early detection of OC and OPC and delivering preventive advice is one of the only aspects of oral healthcare where dental professionals can actually save lives.

In summary, the epidemiology, aetiology, pathogenesis, clinical features, management and preventive advice relating to OC and OPC is taught in depth to dental undergraduates and also to DCPs. There is a need for increased teaching of OC and OPC to medical students. Knowledge of and the ability to detect and refer patients with OC or OPC decreases in general dental practice and although there is recommended CPD in the area of early oral cancer detection, further CPD reflecting the changing epidemiology and aetiology of OC and OPC is desirable. There is a continuing need to ensure the in-depth level of teaching and understanding of OC and OPC is maintained within the undergraduate curricula and indeed updated to reflect the changing incidence and aetiology, particularly relating to HPV infection. Failure to do so will decrease the ability of dentists and DCPs in the future to properly care for their patients in the one area of clinical practice where they can save lives.

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