Effects of Tobacco Use on Oral Mucosa

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Abstract

Numerous major ailments, including cancer and cardiovascular diseases, as well as numerous other health issues, are associated with tobacco smoking. Worldwide, tobacco smoking results in a significant number of fatalities and serious illnesses each year. The harmful effects of tobacco use on dental health are just one of the numerous health issues associated with it. A wide range of oral health issues are brought on by tobacco smoking, from social (poor breath) to life-threatening (precancerous alterations leading to oral cancer) and serious (periodontal illness, tooth decay).Tobacco can be ingested orally in a number of ways, such as smoked tobacco, smokeless tobacco chewed on its own, or tobacco mixed with areca nut. The dental health is negatively impacted by all of these tobacco products. Quitting tobacco products is the most important preventive action to avoid the oral health issues brought on by tobacco usage.

The risk of developing oral cancer drops rapidly when a smoker ceases tobacco use. After ten years of not using tobacco, an ex-smoker/user's risk of oral cancers is about the same as that for someone who has never smoked. To stop using tobacco products is not an easy task.

Key words:Betel quid, Oral cancer, Prevention, Smoking, Tobacco

INTRODUCTION

Tobacco is the single greatest cause of preventable death globally.[1] Tobacco is consumed in a variety of different ways, though smoking of manufactured cigarettes is the most prevalent form of its use. The emergence of widespread cigar use particularly among adolescents of both sexes has been reported in the past decade in the India.Compared to cigarettes, cigars have a higher overall nicotine content and can deliver nicotine through both direct oral contact with the tobacco

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wrapper and smoke. Cheroots are little tobacco cigars with a strong flavour. One-third of India's tobacco produced for smoking is used for bidi smoking, which is a common tobacco use in South Asia. Bidi's and Kreteks are gaining popularity among young people in North America, and more than 15% of adolescent smokers use these tobacco products. Pipe smoking is one of the oldest methods of smoking and was brought to Europe by sailors from America. Water pipes include special receptacles through which smoke has to pass, ostensibly to reduce its harmful effects. Hookah is an Indian water pipe. The habit of reverse smoking by holding the glowing end of cigarettes or cigars within the oral cavity is described in parts of India.

Smoked tobacco

Many toxins are present in tobacco smoke. Tobacco smoke is made up of "side-stream smoke" from the burning tip of the cigarette and "main-stream smoke" from the filter or mouth end. Tobacco smoke contains thousands of different chemicals which are released as particles and gases. The particulate phase includes nicotine, "tar" (itself composed of many chemicals), benzene and benzo(a)pyrene. The gas phase includes carbon monoxide, ammonia, dimethylnitrosamine, formaldehyde, hydrogen cyanide and acrolein. Some of these have marked irritant properties and some 60, including benzo(a)pyrene and dimethylnitrosamine, have been shown to cause cancer. The tar yield of different brands of cigarettes range from 0.5 mg to 26 mg (averaging 12.5 mg), with the most popular brands containing 15-17 mg of tar. In the European Union (EU) cigarettes have to contain less than 12 mg of tar from 1998.[2] Nicotine yields range from 0.05 mg to 1.7 mg, with the most popular brands yielding 1.0 mg of nicotine. In developed countries over 95% of manufactured cigarettes consumed are filter-tipped. About 10% consume tobacco as roll-your-own cigarettes mostly among lower socioeconomic groups.

Smokeless (chewing) tobacco (ST)

There are two main types of smokeless tobacco - chewing tobacco and snuff. The most written about is smokeless tobacco use among Asians taken with betel/ areca quid. Over 90 percent of Indians add tobacco to the betel quid mixture. Commercially prepared betel quid products that contain mostly areca nut and flakes of tobacco are called Gutka. Other ST products which carry significant mutagenicity are Toombak used in the Sudan, Shamma in the Jizan province in Saudi Arabia, powdered tobacco and alkali mixtures such as Nass/ Naswar used in northern and central

Asia and in Pakistan, Khaini (a mixture of ST and lime) used in Bihar state of India and Nepal, and boiled/sweetened ST called Zarda mostly used by people from Bangladesh

Second-hand or environmental tobacco smoke (ETS) ETS is carcinogenic to human beings. Meta-analyses have shown a significant association between lung cancer and smoke exposure from a spouse and also between lung cancer and exposure at work. Risks for other cancer types are inconclusive. There is at present insufficient evidence that children exposed to parental smoke have an altered risk of developing any cancer.

EPIDEMIOLOGY

Tobacco which annually kills 4.9 million people worldwide at present is estimated to take 10 million lives every year by 2020. The more depressing part is that half of them will die in their middle age. A global estimate of smoking prevalence by each country is given in a WHO data base for reference.[4]These are based on adult and youth smoking behaviours collected from population-based, cross-sectional surveys at a given point of time. China is the largest producer of tobacco in the world as well as the largest consumer. A national prevalence survey in 1996 among adults (age 15+) found that 63% of males smoked. In Malaysia, three National Health and Morbidity surveys which have been conducted since 1986, the prevalence of smoking among adults age 18 and above were more than 20%; i.e., 21.5% in 1986, 24.8% in 1996 and 22.8% in 2006.

CLINICAL PRESENTATION

General effects

Smoking-attributed diseases include cancer of trachea, lung, bronchus, lip, mouth and pharynx, ischemic heart disease, stroke, hypertension, bronchitis, chronic obstructive pulmonary disease, emphysema and asthma.

Effects of tobacco on teeth and oral health

The damaging and harmful effects of tobacco usage on oral health are now well recognized, in particular a higher prevalence and severity of periodontal diseases among smokers and the association of tobacco use with candidiasis,[10]and with oral malignancies. Several recent

documents have reviewed the scientific evidence relating to the oral disease burden attributable to tobacco use and have highlighted the role and the need for the dental profession to get involved with tobacco intervention.[5]

Smoking cause's discolouration of teeth and some argue that tobacco in fact might increase dental decay as it lowers salivary pH and the buffering power. Smoking is likely to cause halitosis and may affect smell and taste. Smokers may present with generalised melanosis of the oral mucosa that often necessitate investigations to exclude other systemic disorders. Wound healing is impaired in tobacco smokers possibly due to local vasoconstriction and poor neutrophil function. There is fair evidence that tobacco use is a major factor in the progression of periodontal disease.[6,2] Smokers have an increased prevalence of periodontitis, and their disease severity is higher with greater alveolar bone loss resulting in deeper pockets compared with non-smokers.[10] Acute necrotising ulcerative gingivitis (ANUG) has been shown to be associated with heavy smoking.

a) Oral cancer

Over 80 percent of oral cancers are associated with tobacco use.[2] Oral squamous cell carcinoma presents in a variety of ways such as white and red patches, non-healing ulcers or exophytic growths. Most early lesions are asymptomatic. Persistent ulceration with rolled margins and fixation to underlying tissues are pathognomonic signs of oral malignancy. In late stages, disease spreads to adjacent structures notably involving regional lymph nodes, and can cause mobile teeth and loss of teeth or even pathological mandibular fractures. These stages may be associated with pain, numbness or paraesthesia. The clinical features of oral cancer are described elsewhere.Currently diagnosing oral cancer relies on pathological examination by biopsy and use of imaging techniques to estimate the spread of the disease.[2,4]

b) Oral leukoplakia

Oral leukoplakia is the most prevalent potentially malignant lesion, described as a mainly white lesion of oral mucosa that cannot be recognized as any other identifiable lesion[5]. Leukoplakia may present as a uniformly white homogeneous lesion, or as a non-homogeneous speckled lesion with red and/or nodular characteristics. Leukoplakia is commonly connected with tobacco smoking but idiopathic types of leukoplakia are identified. The site of oral cavity affected by

leukoplakia is often said to be associated with the type of tobacco habit practiced. Lateral tongue and floor of mouth in cigarette smokers, Palate in pipe smokers and reverse smokers, Commissures in bidi smokers, buccal groves in tobacco chewers where they park the quid and lower or upper labial mucosa in snuff dippers. In 1995, Tobacco smoking in men was substantially linked with leukoplakia of the buccal mucosa and with all leukoplakia of the floor of the mouth in both sexes. Patients with oral leukoplakia who smoke should have a biopsy to look for dysplasia. In case of moderate to severe oral epithelial dysplasia surgical intervention is required. Intervention studies have shown that leukoplakia in smokers can be reversible if the smoking habit is decreased or discontinued. "A blazing red patch that cannot be identified clinically or pathologically as any other defining disease" is the definition of erythroplakia[7]. Certain cases of erythroplakia may be caused by tobacco use. Leukokeratosis nicotina palati or smoker's palate. Chronic smokers frequently have a greyish white discoloration of the palate with several red raised spots (inflamed small salivary gland apertures). Since cancer is not known to develop from this benign keratosis, it is regarded as a benign lesion.

c) Reverse smoker's keratosis

This is serious potentially malignant lesion encountered in people who place the glowing end of the cigar or cigarette inside the mouth. The clinical appearance is often a mixture of red and white plaques.

AETIOPATHOGENESIS

The main risk factor for over 80% of oral cancers has been shown to be tobacco smoking (i.e., smoking cigarettes, pipes, or cigars), especially when paired with heavy alcohol intake[9]. Cigarette and cigar smokers have an overall risk of oral and pharyngeal malignancies that is seven to ten times higher than that of non-smokers. This is not unexpected because smoking exposes the mouth cavity to carcinogens whether or not it is breathed. There is a substantial dosage response association between smoking rates and mouth cancer risk when daily tobacco use frequency is calculated. When ST is added to areca quid, the product's relative risk increases by over fifteen times. Patients who smoke exhibit a decrease in inflammatory clinical symptoms, which may be linked to nicotine's effects on cellular metabolism, vasculature, and local vasoconstriction. This could reduce gingival inflammation symptoms. The pathophysiology of

periodontitis in smokers may be associated with decreased neutrophil activity, altered host response and susceptibility, as indicated by serum antibody responses to periodontal pathogens and possibly reduced gingival fibroblast function[3]. More smokers are said to continue to have periodontal pathogens in their cultures following treatment. This could be a factor in the treatment outcomes that non-compliant smokers frequently experience.

DIAGNOSIS

The identification of tobacco use is based mostly on the social history taken. This should include inquiries about the sort of tobacco habit, the daily frequency, and the duration of usage. The age of onset is also an essential risk factor for many illnesses and should be recorded. Current smokers may be regular or occasional smokers. Regular smokers are those who smoke every day. Some tend to binge smoke when they drink alcohol solely but are unlikely to be hooked to tobacco. The tobacco handling is generally observed on the fingers of heavy smokers and the tobacco stains on the oral mucosa and teeth. Many smokers have a discolored dorsal tongue. A smoker can also be highlighted by a poor breath.

TREATMENT AND INTERVENTIONS

Tobacco dependence shows many features of a chronic disease. Regular smokers are addicted to the habit as tobacco use results in true drug dependence. A minority is able to quit in one attempt but the majority may need some assistance to cease tobacco use. Numerous effective treatments are now available, and the dentists, oral physicians and their team members should become actively involved in efforts to reduce smoking. Smoking cessation advices delivered by dentists have shown to be effective. Brief advice given by a clinician lasting about 3 minutes can yield a cessation rate up to 5% [3,4]. With additional support such as recommended use of nicotine replacement therapy the quit rates achieved could be doubled. In treating a smoker (willing to quit) the 5A's [5]

a) Pharmacotherapy

The best way to treat smoking, like other chronic illnesses, calls for a variety of strategies in addition to medical assistance. Numerous products, including nicotine patches, gum, lozenges,

inhalers, and nasal sprays, are available because pharmacotherapy has been shown to be successful. Non-nicotine medication approved for smoking cessation is bupropion (Zyban) therapy starting one week before the quit date and continued up to 12 weeks after quitting. There are several medical contraindications particularly those with a predisposition to seizures and/or a history of epilepsy. Pregnant and breast-feeding mothers should not be prescribed this drug. Bupropion therapy increases the chances of quitting considerably up to 30%.

b) Prevention

A crucial component of public health is the prevention of tobacco use. Since tobacco use and experimentation begin early in life, young people should be the target of prevention strategies. Family doctors, school dentists, orthodontists, and pedodontists can all take action to encourage young children to never start smoking. Tobacco sales are known to be impacted by laws pertaining to tobacco advertising, taxes, and public smoking bans. One successful strategy to lower morbidity and death from oral cancer is primary prevention, which involves helping people avoid using tobacco in the first place and helping existing smokers stop.

CONCLUSION

The oral health ill-effects of tobacco in whole or in part are well known, and there is weighty evidence that tobacco use has considerable influence on oral health. But tobacco use is a modifiable risk factor for oral diseases, and an obvious professional interest in tobacco intervention can make a big difference in the health of an individual or the outcome of a given disease. Dentists have probably the greatest access to ‘healthy’ tobacco users in the healthcare system, and even in the absence of tobacco-related diseases in the mouth, the dentist will easily recognize these patients. Therefore, dentists should pursue more formal training in tobacco cessation counselling, which should be as much a part of their job as plaque control and dietary advice.

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