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Review Article

Tobacco and Health–A Review

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Abstract

Tobacco use is a major health problem which is fastly spreading globally. WHO states that, tobacco chewing is one of the causes of death worldwide and responsible for approximately 50 lakhs deaths every year. Tobacco consumption results in systemic conditions that include cardiovascular disease, lung disease, and numerous types of cancer, and is the single largest cause of death in the India, Tobacco consumption causes increased risk of oral cancer and other mucosal lesions, periodontal disease, impaired healing, and dental caries. Dentist should Educate and advice patients on tobacco cessation, and refer them or try to implement a cessation program, thereby helping patients stop using tobacco and improve their health. The purpose of this paper is to review the health hazards of tobacco use and methods of tobacco cessation. So that available treatments to prevent tobacco use and increase cessation should be implemented effectively. Dental surgeons can provide an excellent platform for tobacco prevention and cessation.

Keywords: Cessation; NRTs Nicotine; Smoking; Tobacco; Oral Cancer

Introduction

Tobacco use is prevalent in adults and teenagers. India is the fourth largest producer of tobacco; and second in the world after China in cigarette and bidi production, according to an Indian Council of Medical Research (ICMR-2012) report. There are 18.4 crore tobacco users in India with 4 crores using cigarette, 8 crores using bidis and 6 crores using chewable forms of tobacco. Nearly 45% of Indian men and 12% of women use some form of tobacco. It has been estimated that tobacco kills 90 persons every minute. It is assumed by researchers that up to 2020, 13% of all deaths will be due to tobacco use [1].

The use of tobacco is hazardous to oral and systemic health. Environmental smoke damages systemic health of individuals exposed to it and also their oral health. Tobacco can beconsumed as cigarettes, cigars, or in pipes, while smokeless tobacco can be used as snuff or as chew tobacco, which is the more common type. Snuff can be inhaled through the nose or orally [2].

Greater use of tobacco increases the risks of oral diseases. The effect of tobacco on the occurrence of oral diseases is directly proportional.

The focus of the review is on the adverse effects of tobacco on oral and systemic health and available therapy for the tobacco intervention [2,3].

The impact of tobacco use on health

Oral cancer and other mucosal lesions

Leukoplakia, oral malignancies and other oral mucosal lesions occurs due to tobacco smoking or the use of smokeless tobacco. Cigarettes, cigars, pipes, and smokeless tobacco cause oral precancer and cancer. Tobacco along with areca nut can cause Oral submucous Fibrosis (OSMF). The disease is characterized by blanching and stiffness of oral mucosa, trismus, and burning sensation in the mouth. Currently areca nut/betel quid use is the single-most important etiological factor considered in OSMF Malignant transformation rate of OSMF was found to be in the range of 7-13% [4].

Oral cancer includes all cancers of the lip, tongue, gingiva, all of the oral mucosa and oropharynx [5].

N-nitrosamines, aromatic amines, and polycyclic aromatic hydrocarbons present in smoke tobacco are major carcinogens contributing to the oral cancer. In smokeless tobacco, the nitrosamines formed are more carcinogenic.Some inherited genotypes may lead to tobacco-related oral disorders. The genes involved are N-acetyl transferases, glutathione transferases, and P450 pathway.

Greater amounts of tobacco used or longer duration of use will cause more chances of development of premalignant lesions as compare to non users [6].

There are simple chairside methods to detect Oral precancerous conditions such as Toludine blue staining, brush biopsy, vizi lght etc.

Figure 1

Periodontal disease

Cigarette smoking can cause periodontal diseases and delayed healing after periodontal surgery. The number of cigarettes smoked per day is directly proportional to the risk. It can also lead to Acute Necrotising Ulcerative Gingivostomatitis. (ANUG). Acute necrotizing ulcerative gingivitis is a painful infection of the gums. Symptoms are acute pain, bleeding, and foul breath. Diagnosis is based on clinical findings. Treatment is gentle debridement, improved oral hygiene, mouth rinses, supportive care, and, if debridement must be delayed, antibiotics.

Acute necrotizing ulcerative gingivitis (ANUG) occurs most frequently in smokers and debilitated patients who are under stress. Other risk factors are poor oral hygiene, nutritional deficiencies, immunodeficiency [6-8].

Smokeless tobacco users appear to have more gingival recession at facial sites than non-users, this finding corresponds to the location in the mouth where the smokeless tobacco lesions occurred and to where the tobacco was placed. Studies suggest that recession increased within a one-year period in smokeless tobacco users [5].

Caries

Chewing tobacco users had slightly higher mean numbers of decayed and filled coronal surfaces than persons using other forms of tobacco. The mechanism suggested was that high levels of fermentable sugars in chewing tobacco stimulate the growth of cariogenic bacteria [2,6].

Wound healing

Tobacco use is known to impair wound healing [7-9].

- Tobacco users have decreased levels of salivary and serum immunoglobulin which affects wound healing in the oral cavity and the mouth's ability to clear pathogens.
- Tobacco users have decreased blood oxygenation leading to decreased oxygen delivery to the tissues which also impairs healing following oral surgery.
- The loss of the blood clot that follows the removal of teeth occurs four times more frequently in smokers than in non-smokers.
- There is also evidence which suggests that smoking inhibits healing through the effects of decreased oxygenation in the blood and tissues, and constriction of blood vessels.

Oral hygiene and staining of the dentition

In addition to an increased prevalence and incidence of oral conditions, tobacco users have poorer oral hygiene as compared to nonusers. Staining of the dentition, ranging from mild to heavy, is seen in smokers and in smokeless tobacco users and are both associated with halitosis [2].

Systemic diseases and conditions

Tobacco use results in a greater risk of cancer, lung disease, and cardiovascular diseases. Recent studies have shown that smokeless tobacco also increases the risk of cardiovascular disease; smokeless tobacco users have higher daytime heart rates than nonusers and have twice the risk of dying from cardiovascular disease [10].

Smokeless tobacco has also been found to be associated with pancreatic cancer. Smoking tobacco can cause Alzheimer's disease, and its use during pregnancy may result in complicatied pregnancy. Other effects of tobacco use include oxidative damage, increased inflammation, increased levels of inflammatory markers [11].

Figure 2

NICOTINE: Main addictive factor

Nicotine is highly addictive. Nicotine affects many different parts of the body at the same time.

After just one puff of a cigarette it begins to act on the central nervous system, brain and other parts of the body.

It actually stimulates our system, even though it makes individual feel relaxed. Nicotine affects chemicals in the brain and, after a puff; user usually feels good for some time, which is why many smokers view smoking as stress relief when under pressure [11].

Figure 3

Tobacco cessation programs

Tobacco smoking is psychologically and physiologically addictive; while smokeless tobacco is physiologically addictive. Tobacco cessation requires that patients be motivated to fight their addiction. Methods include referral to counseling and quit lines, pharmacotherapeutic intervention, self-help materials and the use of transtherotical model" [1].

Figure 4

Cessation Methods

The effectiveness of interventions in a dental setting to achieve tobacco cessation is considered by Needleman., *et al*. Dental prophylaxis at start of quitting may be a motivator by removing plaque, calculus and stain. A periodontal evaluation should also take place if this is not done previously [2].

Tobacco cessation methods fall into two broad groups: Behavioral interventions [1,12]**.**

These include in-person counseling, telephone counseling, printed self-help materials and "5As" model**.**

Figure 5

Nicotine dependence counselor and development of an individualized treatment plan should be done.

Action	Element of plan "STAR"
Help the patient to develop the quit plan	Set a quit date, ideally within the next two weeks. Tell family and friends and ask for social support Anticipate challenge including withdrawal symptoms. Remove all tobacco products before quitting, avoid smoking in places where you spend a lot of time (workplace, home, car).

Table 1: How to develop the 'quit plan'.

(Curtsey - Gawali SM and Vaidya SM Quitting smoking – How to go about it.) [11].

"Cold Turkey" is the mostly frequently used method advanced by Wayne., *et al*. Cold Turkey means abrupt cessation of all nicotine use.

Cut-down to quit

Gradual reduction involves slowly reducing one's daily need of nicotine by applying NicoBloc drops on cigarette filter which absorbs 99% of tar and nicotine.

Pharmacotherapy interventions [1,12].

Nicotine replacement therapy (NRT)

At present, NRT is the most common form of medication used for treatment of tobacco dependence which is approved by the US FDA.

Nicotine replacement therapy (NRT) provides controlled doses of nicotine to relieve withdrawal symptoms and can increase cessation rates by 150% to 200%. NRT is available as Transdermal patches (Habitrol, Nicoderm CQ, Nicorette), gum, (Nicotinell) and lozenges.

Five types of NRTs for quitting are

1. Transdermal nicotine patches
2. Nicotine chewing gum (7 - 21 mg)
3. Nicotine polacrilex lozenge (2 - 4 mg)
4. Nicotine nasal spray
5. Nicotine oral inhaler

FDA-approved non-NRT medications

Bupropion (Zyban, Glaxo-Smithkline), originally developed as an antidepressant, can double the cessation rate compared with no intervention or placebo. Bupropion can be used in combination with NRT, although there is insufficient evidence of an additive effect. It is a sustained-release tablet taken twice daily and believed to work by reuptake inhibition of dopamine and noradrenalin. Side effects include insomnia, headache, dry mouth, and nausea.

Varenicline (Chantix, Pfizer) is a selective nicotinic receptor partial agonist that reduces the pleasure of smoking and helps reduce withdrawal symptoms. The most common adverse event reported in a trial was nausea [1,12].

Pharmacotherapy	Dosage and Duration	Side Effects	Contraindications
Bupropion	150mg OD for 3 days followed by 150mg BD for 7 to 12 weeks	Dry mouth insomnia	Seizure Head trauma Eating disorders
Nicotine patch	21mg/24 hours for 4 weeks, then 14mg/24 hours for 2 weeks, then 7mg/24 hours for 2 weeks	Local skin reactionnsomnia	
Nicotine gum	For 1-24 cigarettes — 2mg gum (upto 24 pieces/day) for 12 weeks. For >25 cigarettes — 4mg gum (upto 24 pieces/day) for 12 weeks	Mouth soreness Dyspepsia	
Nicotine inhaler	6-16 cartridges/day for 6 months	Local irritation of mouth and throat.	
Nicotine nasal spray	1-2 doses/hour for 3 to 6 months	Nasal irritation	

Table 2: Pharmacotherapy for Tobacco cessation.

(Curtsey- Kumar R and Prasad R. Smoking Cessation: An Update) [1].

Conclusion

In view of the effectiveness of various tobacco cessation measures, it is prudent to include tobacco cessation into the health care delivery system. Emphasis should be to motivate tobacco users to take help of specialized tobacco cessation centers for quitting. Dental clinicians are in a unique position to educate and motivate patients concerning the dangers of tobacco to their oral and systemic health, and to provide or recommend intervention programs as part of routine patient care.

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