

Tobacco Abuse on Oral Health – An Overview

¹Dr. Jaydeeba Basak, MDS, Consultant Dental Surgeon Sight and Smile Clinic, Newton, Kolkata, West Bengal

Corresponding Author: Dr. Jaydeeba Basak, MDS, Consultant Dental Surgeon Sight and Smile Clinic, Newton, Kolkata, West Bengal

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Abstract

Consumption of tobacco in smoke or smokeless form is hazardous to health. As oral environment is exposed to tobacco, its effects are visible primarily on oral health and thus it is considered as major etiologic factor in malignant and nonmalignant oral diseases. Many of them subside with cessation of tobacco but few remain irreversible. Tobacco in addition with other risk factors adds potential threat to oral tissues. This article presents an overview of abusive effects of tobacco on oral tissues and focuses on its prevention and control.

Keywords: Smoking, Tobacco, Potentially Malignant Disorders, Oral Cancer, Tobacco Cessation

Introduction

Tobacco and its by products are constant irritation to oral tissues. The form in which it is consumed describes the site, appearance of the lesion¹. About 24% of the adult population use tobacco as per data suggested by WHO in 2018 killing more than 8 million people per year around the world². Nearly 267 million adults (15 years and above) in India (29% of all adults) are users of tobacco, according to the Global Adult Tobacco Survey India, 2016-17³. 8.5% currently use some form of tobacco (boys 9.6%; girls 7.4%) and 4.1% smoke tobacco and 4.1% use smokeless tobacco⁴.

The most prevalent form of tobacco use in India is smokeless tobacco and commonly used products are khaini, gutkha, betel quid with tobacco and zarda. Smoking forms of tobacco used are bidi, cigarette and hookah³. All commercial tobacco products including smokeless tobacco, cigarette smoke, and cigar smoke contain tobacco-specific nitrosamines, which form during the curing and processing of tobacco. *N'*-nitrosornicotine (NNN), 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) and its major metabolite 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) - are the most carcinogenic. Nicotine is the addictive constituent of all tobacco products including smokeless tobacco. NNN, the main component of smokeless tobacco that induces cancer of the oral cavity and esophagus, is closely related structurally to nicotine^{5,6,7,8}.

Impact of tobacco on oral hard tissues

Discoloration of teeth: A dark brown to black discolouration of the cervical margins of teeth caused by tar and other by-products of combustion is commonly associated with smoking⁹.

Impact of tobacco on gingival tissues

Periodontitis - Smoking increases the incidence of periodontitis. It increases the depth of periodontal pockets and loss of attachment of periodontal ligaments causing gingival recession and periodontal problems¹⁰.

Pigmentation - Hedin et al. first reported that smokers showed greater gingival pigmentation than non-smokers. This is due to activation of melanocytes which results into accumulation of melanin resulting in gingival discoloration¹¹.

Impact on tobacco on oral mucosal tissues

Burns and keratotic patches are common on the lips at the site of habitual cigarette smoking, particularly where the cigarette or cigar is retained as a stub for lengthy periods. The lesions characteristically appear on the mucosal surface of the lower and upper lips at the site at which the cigarette is held. They are characterized by flat or slightly elevated whitish areas with red striations.

Tobacco pouch keratosis, characterized by wrinkled surface that ranges from opaque white to translucent and are located in the area where the snuff is placed. The lesions subside with cessation of tobacco use.

Black hairy tongue – this occurs due to hypertrophy of filiform papillae and retardation of the normal rate of desquamation on the dorsal surface of the tongue which produce a hair-like appearance. It is generally asymptomatic but patient may complain of gagging and tickling sensation.

Nicotinic stomatitis – commonly seen in heavy pipe smokers, reverse smoking characterized by multiple pin point red dots on palate posterior to rugae. These dots are inflamed duct opening of minor salivary glands which later assumes a grayish-white and nodular appearance due to periductal keratinization¹.

Leukoplakia – it is a potentially malignant disorder which has 19-fold increase risk of transforming into malignancy. It is multifactorial but one of the most important risk factor is tobacco. It appears as grayish white patch which can be either homogenous or non-homogenous. The later has high chances of becoming cancerous¹².

Oral Submucous Fibrosis – this condition is most commonly encountered characterized by decreased mouth opening, burning sensation and blanching of oral mucosa.

Oral cancer – tobacco induced oral cancer is mostly squamous cell carcinoma. The possible carcinogenic pathways are summarized in figure below. Many studies have shown that tobacco can cause the abnormal expression of p53, GLUT-1, p16, DAPK, MGMT, P13K and other genes in oral epithelium, which is associated with the occurrence of OSCC¹³.

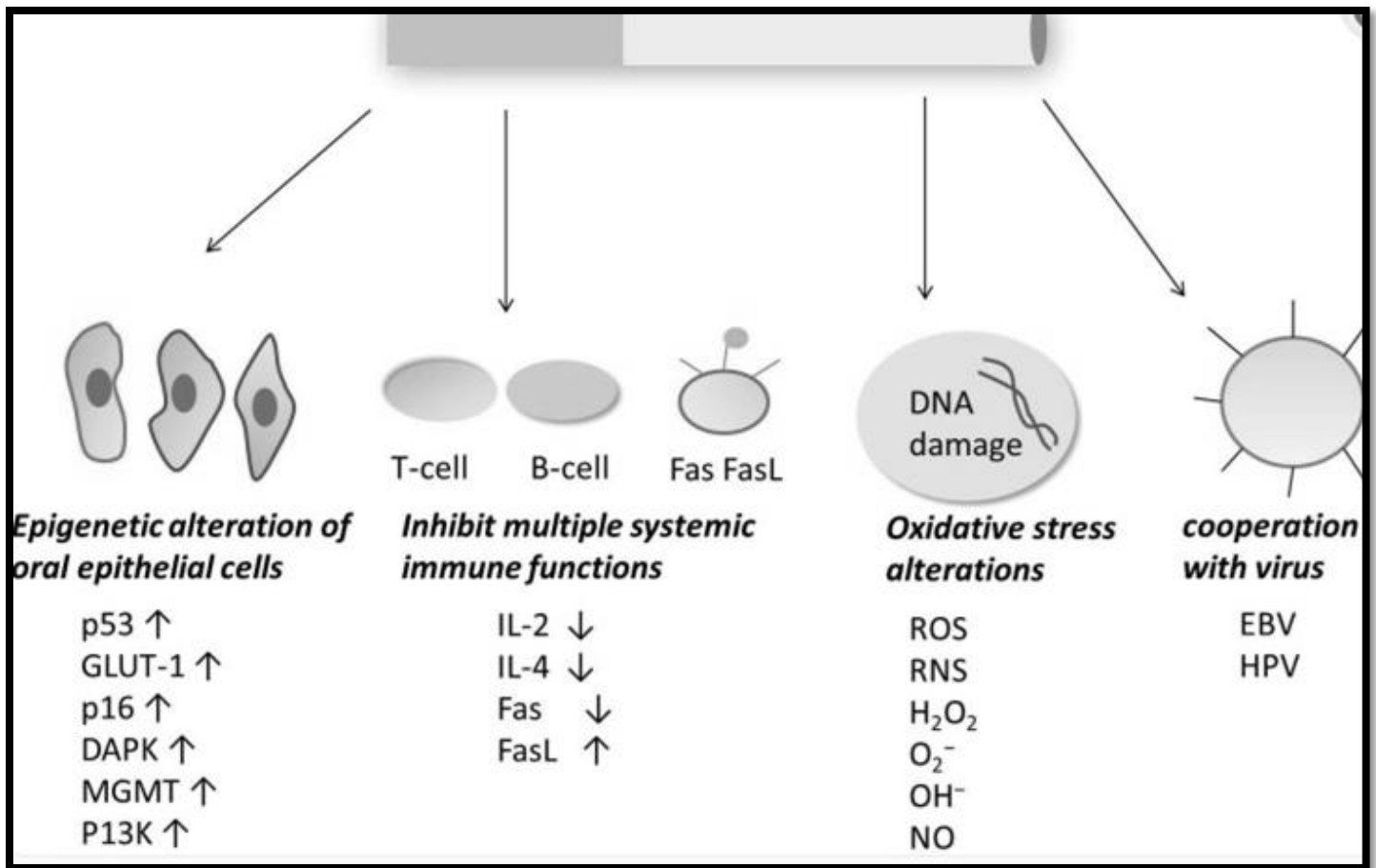


Fig. 1: The possible carcinogenic pathways¹³.

Tobacco Cessation Counseling

The U.S. Department of Health and Human Services and Agency for Healthcare Research and Quality has published a 5-step algorithm for healthcare professionals to use when engaging patients who are dependent on nicotine called "the 5As". The 5 steps are as follows:

Ask: Problem identification and documentation of tobacco use status for every patient at every visit.

Advise: In a strong, clear, and personalized manner, urge every tobacco user to quit.

Assess: Is that smoker willing to form a quit attempt this time? If yes, proceed to the next step, if no 5R principle is used.

Assist: For the patient willing to make a quit attempt, use counseling and pharmacotherapy to help him or her quit.

Arrange: Schedule follow-up contact, face to face or by telephone, preferably within the first week after the quit date.

The "5 R's," Relevance, Risks, Rewards, Roadblocks, and Repetition, are designed to motivate smokers who are unwilling to quit at this point².

Conclusion

As it is said prevention is better than cure, early diagnosis is the key to prevent the toxic effects of tobacco on oral tissues. Tobacco is hazardous and due to its extensive usage its impact on oral environment is getting prominent.

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