

Tobacco: An overview

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ABSTRACT

The aim of our review is to have a complete description of tobacco right from its origin, prevalence, composition, health hazards, and preventive measures. Tobacco is a well-known etiology for causing precancerous and cancerous diseases, which kills nearly 7 million people worldwide every year. In this review, we would like to brief the patterns and prevalence of tobacco use, forms and composition of tobacco use, health hazards of tobacco use, and tobacco control and preventive measures. As a dentist, we play a pivotal role in educating smokers and help them to withdraw their habits. It is essential for all the dentist to undergo a mandatory tobacco cessation training program to motivate the tobacco users to abstain themselves from their habits and to help the community as a whole in reducing the global disease burden. Tobacco causes addiction, cancer of the lung, larynx, oral cavity, pharynx, esophagus, stomach, pancreas, liver, kidney, urinary bladder and cervix, and myeloid leukemia. The oral effects of tobacco include discolorations of teeth and restorations, c/hairy tongue, reduced ability to taste and smell, smokers' melanosis, smokers' palate, dental caries, oral candidosis, increased failure rates for dental implants, periodontal disease, smokers' white patch/leukoplakia, and oral cancer.

KEY WORDS: Cessation, Health hazards, Prevalence, Tobacco

BACKGROUND

The consumption of tobacco among human beings was documented since 600 A.D.^[1] Columbus introduced tobacco in Europe from the Caribbeans. It came to India by the Portuguese.^[2] Tobacco is a killer who kills nearly 7 million people worldwide every year. The World Health Organization (WHO) estimated globally that there were 100 million premature deaths due to tobacco in the 20th century, and if it continues, the premature death is expected to be around 1 billion in the 21st century.^[3] A case-control study by Jha *et al.* estimated that around 1 million deaths a year in India are due to smoking by the early 2010s.^[4]

PATTERNS AND PREVALENCE OF TOBACCO USE

The data on tobacco consumption can be taken from Global Adult Tobacco Survey (GATS-2), National Family Health Survey (NFHS), and Global Youth

Tobacco Survey (GYTS). The GATS is a global standard for systematically monitoring adult tobacco use (smoking and smokeless) and tracking key tobacco control indicators. The estimates of the GATS-2 conducted during 2016–2017 indicate that 19.0% of men, 2.0% of women, and 10.7% (99.5 million) of all adults currently use smoking tobacco. 29.6% of men, 12.8% of women, and 21.4% (199.4 million) of all adults currently use smokeless tobacco. 42.4% of men, 14.2% of women, and 28.6% (266.8 million) of all adults currently use tobacco (smoked and or smokeless tobacco).^[5] The NFHS provides information on population, health, and nutrition for India, and each State/Union territory. According to NFHS conducted during 2015–2016 indicates that women who use any kind of tobacco in urban areas is 4.4% and rural areas are 8.1%. Men who use any kind of tobacco in urban areas is 38.9%, and rural areas are 48%.^[6] The GYTS is a school-based survey designed to enhance the capacity of countries to monitor tobacco use among youth and to guide the implementation and evaluation of tobacco prevention and control programs. According to GYTS survey within the age group of 13–15 years as at December 31, 2016, indicates that

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19.0% of males and 8.3% of females currently use tobacco, 5.8% of males and 2.4% of females currently are cigarette smokers, and 11.1% of males and 6.0% of females use smokeless form of tobacco.^[7]

Second-Hand Smoke

Second-hand smoke is the smoke that fills restaurants, offices or other enclosed spaces when people burn tobacco products such as cigarettes, beedis, and water-pipes. The estimates of the GATS-2 conducted during 2016–2017 indicate that 38.7% of adults were exposed to second-hand smoke at home. 30.2% of adults who work indoors are exposed to second-hand smoke at their workplace. 7.4% of adults were exposed to second-hand smoke at restaurants.^[5]

Third-Hand Smoke

It is the fraction of tobacco smoke that persists in indoor environments after smoking.^[8] Small children are vulnerable because they are exposed through inhalation, ingestion, and dermal contact. And also, there is an increased risk of cancer in those children in the age group of 1–16 years who are exposed to third-hand smoke.^[9]

FORMS AND COMPOSITION OF TOBACCO

Tobacco is mainly available in smoking and smokeless forms. In smoking forms, it includes beedis and cigarettes or by through devices such as hookah, hookli, chhutta, dhumti, or chillum.^[10-12] Cigars and pipes are not common in India. The smokeless forms betel quid chewing, mishri, khaini, gutka, snuff, and as an ingredient of pan masala.^[13] India has the unique position of growing all types of tobacco which are broadly classified as flue-cured virginia tobacco in Andhra Pradesh and Karnataka, bidi and tobacco in Gujarat and Nipani area of Karnataka, vigar and vheroot in Tamil Nadu and West Bengal, hookah tobacco in Assam, West Bengal, Bihar, and UP, chewing and snuff in Tamil Nadu, West Bengal, Bihar, Assam, and U.P, natu, burley, and lanka in Andhra Pradesh and HDBRG, andpikka tobacco in Orissa.^[14]

NICOTINE

Nicotine is a major constituent of tobacco which has an addictive tendency. It affects the dopamine levels in the brain and increases the number of nicotinic receptors in the brain. Their brain and body become used to functioning on a certain level of nicotine.^[15]

CIGARETTE

It contains 0.7–1.1 g tobacco per cigarette. In a white paper tube cured, shredded, and reprocessed tobacco is a packer. It is available in various forms. They include

bright tobacco, *Nicotiana tabacum*, and American blend.^[16]

BEEDI

About 53% is smoked as beedi in India.^[17] It consists of flakes of sun-cured tobacco (*N. tabacum*) which is hand rolled in a dried leaf (tendu, temburni, etc.).^[18,19] Beedis which are exported are flavored with fruits or chocolates which is attractive for teenagers.^[20]

HOOCAH

They are stronger than tobacco which contains 30% of tobacco with 70% of molasses/honey and fruit pulp. Hookah smoke also contains carbon monoxide due to the use of charcoal.^[21]

CHUTTA

It is a type of small cigars in which a tobacco leaf is rolled into a cylindrical shape and tied at one end.^[19]

KHAINI

It is sun-dried tobacco with slaked lime, cardamom, menthol, and other flavorings.^[22]

GUTKA

It consists of a mixture of supari, tobacco, catechu, and lime, flavorings such as menthol, saffron, and spices such as cardamom, clove, or eugenol.^[19]

HEALTH HAZARDS OF TOBACCO USE

Smoking Tobacco

Smoking tobacco such as cigarette, beedi, and hookah causes addiction, cancer of the lung, larynx, oral cavity, pharynx, esophagus, stomach, pancreas, liver, kidney, urinary bladder and cervix, and myeloid leukemia.^[23,24] It also causes heart disease, clogged arteries, stroke, chronic obstructive lung disease, and adverse reproductive effects as well as periodontitis.^[23] Palatal cancer is commonly seen in patients with reverse smoking.^[19] In addition, hookah causes carbon monoxide poisoning and transmission of tuberculosis, herpes, and hepatitis.^[21] Depending on the frequency of hookah smoking per session, a person inhales more nicotine and other harmful products of tobacco than cigarette smoking which has immediate effects on the heart.^[21]

Smokeless Tobacco

The key factor that may be involved in malignant transformation of oral lesions is cell cycle regulation and DNA methylation, which may lead the oral

epithelial cells down the carcinogenic pathway.^[25] Smokeless tobacco also causes addiction, oral cancer, cancer of the esophagus, acute increases in blood pressure and heart rate, and cardiovascular disease^[23,24]. Gutka also causes worsening of asthma, increased blood pressure and heart rate, cardiovascular disease, and adverse reproductive outcomes.^[26]

SECOND-HAND SMOKE

Second-hand smoke causes serious stroke, nasal irritation, lung cancer, coronary heart disease, in adults. Whereas in infants, it causes sudden infant death syndrome, lower respiratory illness, and impaired lung function. In pregnant women, it causes low birth weight.^[27]

TOBACCO AND ORAL HEALTH

The oral effects of tobacco include discolorations of teeth and restorations, coated/hairy tongue, reduced ability to taste and smell, smokers' melanosis, smokers' palate, dental caries, oral candidosis, increased failure rates for dental implants, periodontal disease, smokers' white patch/leukoplakia, and oral cancer.^[28] Tobacco can induce changes in DNA. The tumor suppressor gene p53 has given much importance in recent years toward smoking-related mutations. p53 plays an important in regulating cell proliferation, and it also plays a key role in the repair of DNA damage.^[29] The mutations in the gene may lead to DNA damage in the cells, which may lead to the development of cancer.

OCCUPATIONAL HAZARDS

During the processing of tobacco leaves for beedis, releases copious amounts of coarse particulates and dust in the work environment. As the tobacco processors are not aware, they do not wear any protective clothing such as gloves or masks. Hence, they are exposed to tobacco dust through cutaneous and nasopharyngeal routes.^[30] Therefore tobacco processing workers often suffer from chronic bronchitis^[31] and also there is a significantly greater chromosomal damage in their circulating white blood cells when compared to unexposed workers.^[32]

TOBACCO CONTROL AND PREVENTIVE MEASURES

There are several measures available for tobacco prevention policies which include COTPA, MPOWER etc. In India, it is mandatory to display health warning on all packages and advertisements of cigarettes since 1975, due to the cigarettes act, which was given by the Government of India.^[33] A comprehensive tobacco control legislation titled "Cigarettes and Other Tobacco Products (Prohibition of Advertisement and

Regulation of Trade and Commerce, Production, Supply, and Distribution) act 2003 in April 2003 and notified in Gazette of India on February 25, 2004, This Bill became an Act on May 18, 2003 – COTPA. On May 1, 2004, the rules were formulated and enforced.^[34]

The Important Provisions of COTPA – 2003 Are

- Prohibition of smoking in public places
- Prohibition of advertisement, direct and indirect advertisement
- Prohibition of sales of cigarette and other tobacco products to a person below the age of 18years
- Prohibition of sale of tobacco products near the educational institutions
- The mandatory depiction of statutory warnings
- The mandatory depiction of tar and nicotine contents along with maximum permissible limits on tobacco packs.

In 2008, the WHO Framework Convention on Tobacco Control introduced a cost-effective way for reduction of tobacco MPOWER.^[35] The MPOWER measures are monitor tobacco use and prevention policies, protect people from tobacco use, offer help to quit tobacco use, warn about the dangers of tobacco, enforce bans on tobacco advertising, promotion and sponsorship, and raise taxes on tobacco.^[1]

Tobacco cessation counseling is conducted for families as a whole will be helpful as they influence each other than individually.^[36] Counseling using 5A's and 5R's are effective in increasing the cessation rate.^[37,38] The 5A's include Ask, Advise, Assess, Assist, and Arrange. It is helpful for those who are ready to quit about tobacco use. The 5R's include relevance, risks, rewards, roadblocks, and repetition which is to be addressed in the counseling to those who are not ready to quit. Tobacco cessation helps smokers achieve beneficial health changes and can live a longer and healthier life.^[39] The immediate and long term health benefits for smokers who quit the habit include.^[39]

- Within 20 min – Heart rate and blood pressure drop.
- 12 h – The carbon monoxide level in your blood drops to normal.
- 2–12 weeks – Circulation improves and lung function increases.
- 1–9 months – Coughing and shortness of breath decrease.
- 1 year – Risk of coronary heart disease is about half that of a smoker.

Nicotine withdrawal symptoms are one constraint which is challenging for the tobacco users to quit tobacco. The symptoms include headaches, coughing, cravings, increased appetite or weight gain, mood changes (sadness, irritability, frustration, or anger), restless, decreased heart rate, difficulty concentrating,

and influenza-like symptoms and insomnia, which is a major barrier against attempting to quit or staying quiet. These symptoms occur due because when nicotine level drops dramatically 1 or 2 h after the last cigarette, it will cause the users to crave nicotine and have withdrawal symptoms. It can be dealt with by either cognitive-behavioral therapies or medical therapies.^[39] When users who smoke cigarettes are looking to quit tobacco they should avoid triggering situations, where smoking is more likely to occur. It can be done by 3A's which include avoid triggering situations, alter your routine, and find alternatives to smoking.^[40]

In India, tobacco prevention and control methods have mainly focussed on awareness and behavioral changes.^[41] Though, various methods and measures are taken for tobacco control, it is still challenging to control the usage of tobacco because, there is a lack of awareness of the potential problems associated with tobacco use and the advertisements of the tobacco industries leading to increased-tobacco consumption in developing countries.^[42] Even there are geographical and infrastructural challenges.^[43] According to the data received in GYTS 2009 among the students in the age group of 13–15 years. 77.5% saw anti-smoking media messages, in the past 30 days 74.4% saw pro-cigarette ads on billboards, in the past 30 days, 8.1% were offered free cigarettes by a tobacco company representative.^[44] Integration of tobacco control activities with developmental programs^[45,46] such as poverty alleviation, rural development schemes, women and child development, and tribal welfare programs can help in tobacco control.

CONCLUSION

As a dentist, we play a pivotal role in educating smokers and help them to withdraw their habits. In our, outpatient clinic, dentists will come across various tobacco users with and without tobacco-related diseases. Various surveys show that 31.5% of doctors had received cessation-related training in a 2003 survey,^[47] and 16.5% work-based training in a 2011 survey.^[48] 54.6% of dentists (in 2006 and 80–83% of doctors (2009–2011) feel they have insufficient experience to offer cessation assistance.^[48-50] Hence, it is essential for all the dentist to undergo a mandatory tobacco cessation training program to motivate the tobacco users to abstain themselves from their habits and to help the community as a whole in reducing the global disease burden.

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