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Research Article

DOES NICOTINE CAUSE THE BRAIN TO RELEASE ADRENALINE AND TO START WITH CREATES BUZZ OF PLEASURE, AND FINALLY LEADS TO DISPLEASURE?

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A B S T R A C T

Cigarette smoking causes injury to nearly every organ of the body, and reduces the health in general. In the United States cigarette smoking is the leading cause of preventable death. Tobacco is a killer. Native Americans discovered the use of the tobacco plant, *"Nicotianatobacum"* during yesteryears, and later widespread throughout western hemisphere. The leaves of tobacco plants contain Nicotine. Nicotine misuse is a significant public health issue. Tobacco smoking leftovers is one of the main preventable causes of ill-health and premature death worldwide. Smoking vandalizes the airways and small air sacs in your lungs. Smoke damage in the lungs can lead to serious long-term lung diseases such as chronic obstructive pulmonary disease (COPD).Smoking shoots up the trouble of lung infections like pneumonia and tuberculosis, and it can aggravate asthma. Tobacco usage is the leading cause of death in the US. Nearly 75 % of lung cancers as well as about 80% of all lung cancer deaths, are due to smoking. Tobacco smoke contains 4000 different carcinogenic. Compounds. Cigarette smoking is increasing in many low, middle-income and even high-income countries, mostly women

INTRODUCTION

The continued popularity of tobacco smoking appears to defy rational explanation. Smokers mostly acknowledge the harm they are doing to themselves and many report that they do not enjoy it – yet they continue to smoke (1,2) The reason is that nicotine from cigarettes generates strong urges to smoke that undermine and overwhelm concerns about the negative consequences of smoking, and the resolve not to smoke in those trying to stop (3) Progress is being made in many countries in reducing smoking prevalence but it remains one of the main causes of ill health and premature death worldwide (4)

Tobacco smoking-related illness remains the leading cause of preventable death in United states(5,6,7) More than 7 million of those deaths are the result of direct tobacco use while around 1.2 million are the result of non-smokers being exposed to second-hand smoke(8) It has also been proposed that there is an auto-immune component to lung disease, caused by the reaction of autoantibodies to antigens created either directly or indirectly from TS (10) Cigarette smoking is still increasing in

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many low-income, middle-income and even high-income countries, especially among women.(11)

Jayes and colleagues summarised recently the evidence of the effect of smoking on the development of asthma among adults.(12) Over the past 30 years, more than 200 million deaths have been caused by smoking tobacco use, and annual economic costs due to smoking tobacco use exceed US$1 trillion (13,14)

The global tobacco epidemic make tobacco control a clear public health priority.(15) Effective implementation of tobacco control policiesincrease healthy life expectancy.(16) Affordability through taxation, passing smoke-free laws, mandating health warnings on packaging, and banning tobacco advertising, promotion, and sponsorship.(17) Tobacco control has been identified as a crucial and necessary part of reaching these goals, with one in six non-communicable disease-related deaths being attributable to smoking tobacco use.(18,19) The prevalence of smoking tobacco use is necessary to guide effective policy and planning.(20)

History

History of Smoking's shows as early as 5000 BC. It was during the 20th century that cigarette smoking became a mass phenomenon. "smoking epidemic" reached its maximum in the 1950s in the male population, with considerable geographic variation in time trends. consumption later evolved into burning the plant substance either by accident or with intent of exploring other means of consumption (21)

The smoking of tobacco and various hallucinogenic drugs was used to achieve trances and to come into contact with the spirit world.(22) Eastern North American tribes would carry large amounts of tobacco in pouches as a readily accepted trade item and would often smoke it in ceremonial pipes, in sacred ceremonies (23)

It was believed that tobacco was a gift from the Creator and that the exhaled tobacco smoke was capable of carrying one's thoughts and prayers to heaven.(24,25)

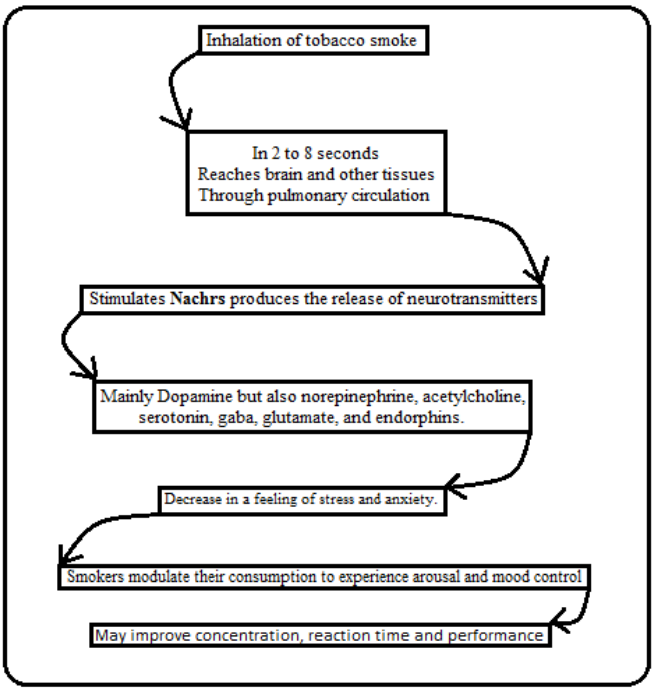
Metabolism of nicotine

Nicotine is metabolised to cotinine by liver enzyme CYP2A6 Cotinine can be used as a marker for exposure to nicotine. CYP2A6 exhibits genetic polymorphism and metabolism of nicotine is rapid in Caucasians than Africans and Asians. (26) Estrogen induces CYP2A6 activity thus, females metabolize nicotine faster than males.(27)

Addiction and withdrawal

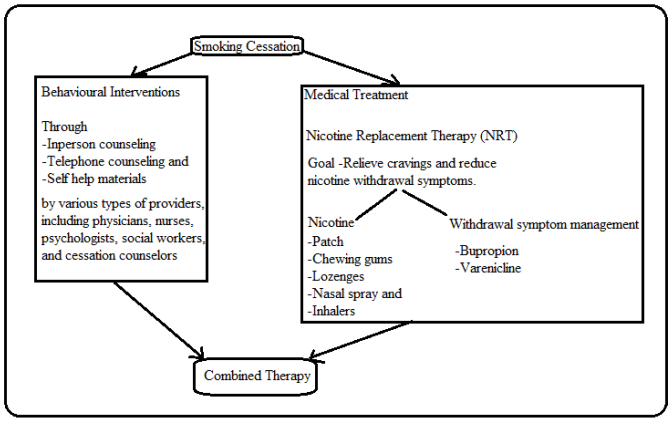
Nicotine is the main addictive agent in tobacco. Major causes of nicotine addiction include lack of enforcement of smoking bans, lack of proper knowledge and education on the topic (28) There is the appearance of nicotine withdrawal symptoms with cessation of smoking which include irritability, mood depression, anxiety, inability to socialize, increased appetite or desire to eat, and sleeplessness.

Longstanding nicotine exposure results in mood disturbances and tobacco craving possibly due to relative decrease in dopamine release. The habituation to cigarette smoking is partly maintained because of conditioning. (29,30)



EFFECTS OF NICOTINE

Smoking Cessation



MANAGEMENT OF SMOKING CESSATION

Pharmacotherapy

FDA approved bupropion SR, varenicline, and NRT (nicotine replacement therapy) for the treatment of tobacco dependence in adults (31,32)

The goal of nicotine replacement is to relieve cravings and reduce nicotine withdrawal symptoms. Rates of smoking cessation may increase from 10% in control groups to 17% in persons using any form of NRT, and using 2 types of NRT has been found to be more effective than using a single type. (33)

Buproprion SR

Bupropion showed increase from 11% in control groups to 19% in Smoking cessation. Some studies show that NRT in combination with bupropion SR may be more effective than bupropion alone.

Varenicline

varenicline shown to increase from 12% in control groups to 28% in smoking cessation. In 2011, the FDA advised that varenicline may slightly increase the rate of cardiovascular events in persons with cardiovascular disease. Results are still pending from a large trial conducted to address this issue.

Combination Behavioral and Pharmacotherapy

Adding behavioral interventions to pharmacotherapy also increased cessation rates from 18% in persons receiving pharmacotherapy alone to 21% in patients using a mix of pharmacotherapy and behavioral support.

Electronic Cigarettes for Smoking Cessation

However, little is known about the ingredients or long-term effects of electronic cigarettes, and to date, no electronic cigarette manufacturer has applied for or received FDA approval to market its product for smoking cessation. Initial studies show that electronic cigarettes contain nicotine and also made add other harmful chemicals, including carcinogens and lung irritants.

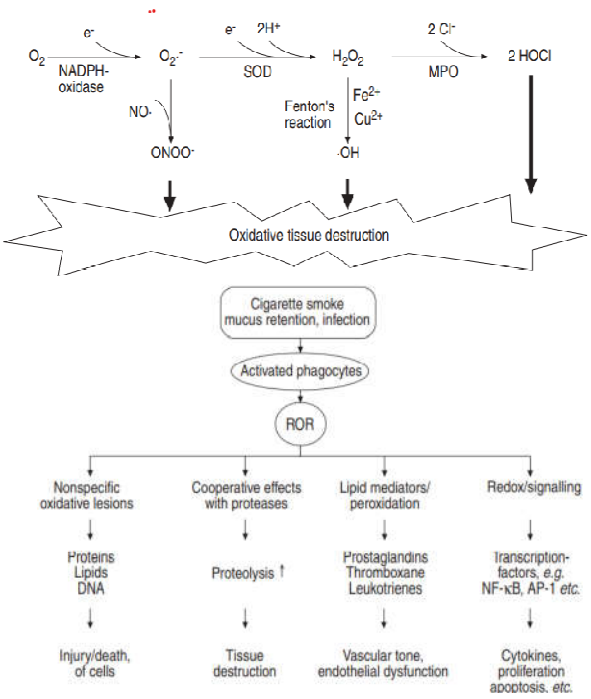
Pregnant Women

According to the U.S. Preventive Services Task Force (USPSTF), behavioral interventions substantially improve the achievement of tobacco smoking abstinence in pregnant women, increase infant birth weight, and reduce the risk of preterm birth.

There is not enough evidence regarding the benefits of NRT during pregnancy and no evidence on the benefits of bupropion SR, varenicline, or electronic cigarettes for smoking cessation in pregnant women.(34)

Mechanism of smoking induced Lung Disease

1. Induction of inflammation:
2. Mutagenic or carcinogenic effect.



Effects of smoking tobacco

The main health issues linked to cigarette smoking are cancer, cardiovascular disease, and obstructive pulmonary disease (copd). A number of researches have looked into the link between smoking and musculoskeletal problems. A large database has accumulated, with consistent evidence of a link between smoking and certain specific disorders. The full scope of tobacco-related diseases and disabilities has yet to be determined, as just a few disease categories (cancer, cardiovascular, and respiratory) have been thoroughly researched.

Smoking is a multisite carcinogenic with a global impact, causing malignancies of the lung, pancreatic, gastrointestinal, liver, lower urinary system (ureter and bladder), renal, uterine cervix, and myeloid leukaemia. The epidemiological data are supplemented by other forms of mechanistic evidence. Overall, the mechanistic evidence pertaining to the measurement of tobacco compound metabolites, the formation of DNA or protein adducts, and the spectrum of gene mutations substantiates and elucidates the genetic and molecular changes induced by tobacco smoke, addressing earlier criticisms about the limited understanding of tobacco carcinogenicity mechanisms. Changes in the p53 gene, which is critical for cellular level of dysregulation and carcinogenesis, are caused by polyaromatic hydrocarbons (PAH), which are carcinogenic chemicals prevalent in cigarette smoke.

Challenges

There is no such thing as a safe amount of tobacco use; the best answer for any smoker is to give up completely. Smoking cessation therapy includes brief clinical counselling, medication, and various non-pharmacological techniques.

Though smoking remains a burden especially bidi smoking amongst low income groups such as migrants the prevention and cessation opportunities are minimal and are not targeted towards high burden populations.

Offering tobacco prevention and cessation counselling services at NCD clinics operating in PHC (as in Tamil Nadu) will serve the needs of these tobacco using consumers.

Reimagining care delivery through strengthening the integration of services at clients interface with departments of Psychiatry, Respiratory Medicine, Community Medicine are critical models of care to be pro-actively undertaken at the level of all medical colleges.

Though smoking among women in urban areas is on the rise, awareness among care providers is less and social taboos are inhibiting them to address women and tobacco more directly among healthcare providers which needs to be reversed.

Smokeless tobacco still remains the major tobacco products consumed and misinformation about health benefits of chewable forms of tobacco are abundant in women, and low-educational groups which is the determinant for high consumption as well as high burden of oral cancer.

Future directions

The Government of India has drafted the cigarettes and other tobacco products (Prohibition of advertisement and regulation of trade and commerce production, supply and distribution) (Amendment bill) 2020

- "medium" includes but not limited to audio, visual, audio-visual, print (including newspapers or magazines whether domestic or international, pamphlets, leaflets, flyers and letters), billboards, hoardings, posters, signs, non-tobacco products, tobacco accessories, buildings or other structures, vehicles, television, radio, films, music, games, live performances, the internet including over-the-top media services, social media platforms, mobile telephones, and any other technologies;-

- "promote" includes but not limited to supply or offer to supply free samples, sale or offer to sale at discounted price, sale or offer to sale on internet and/or any other forms of communication, sponsorship, recommendation or action with the aim, effect or likely effect of promoting a tobacco product or tobacco use either directly or indirectly;
- "indirectly advertise" includes but is not limited to the followings: 1. the use of a name or brand of tobacco products for marketing, promoting or advertising other goods, services and events; 2. the use of a mark or trade mark of tobacco products for marketing, promoting or advertising other goods, services and events; 3. the marketing of tobacco products with the aid of a brand name or trademark which is known as, or in use as, a name or brand for other goods and services; 4. the use of particular colours and layout and/or presentation those are associated with particular tobacco products; and 5. the use of tobacco products and smoking situations when advertising other goods and services.

Research program to the next generation world

Research about the tobacco use among vulnerable populations such as migrants, women, LGBTQ is urgently needed. Pilot testing of RCT to determine the effectiveness of NRT in these groups is of prime importance.

Current altercation

Non-availability of NRT-nicotine replacement therapy options such as nicotine gums, lozenges at discounted or free of charge in PHC for low income groups who are motivated to quit tobacco.

Summary

Tobacco is the foremost preventable cause of death and disease in the world today, killing half of the people who use it. Tobacco use is a major risk factor for the four main Non-communicable Diseases (NCDs) cardiovascular disease, cancer, chronic lung disease and diabetes, which puts people with these conditions at higher risk for developing severe illness when affected by COVID-19.Tobacco smoke contains almost 7,000 hazardous chemical components that enter the human body explicitly through cigarettes, indirectly through second-hand smoke inhaled by a smoker, or downstream smoke produced from a cigarette or tube. Third hand smoke exposure puts both smokers and non-smokers at risk of being exposed to the components of smoked tobacco that collect on surfaces in a non - ventilated atmosphere A decline in the use of nicotine products, as outlined in the WHO International Health regulations, was a key component of this plan.

CONCLUSION

Cigarette smoking damages nearly every organ of the body, causes many diseases, and reduces the health of smokers in general. In the United States cigarette smoking is the leading cause of preventable death. It increases your chance of dying. Smoking is not only a killer, but a serious cause of illness. Smoking affects fertility. It gives you bad breath. Smoking causes cancer, heart disease, stroke, lung diseases, diabetes, and chronic obstructive pulmonary disease (COPD), which includes emphysema and chronic bronchitis. Smoking also increases risk for tuberculosis, certain eye diseases, and problems of the immune system, including rheumatoid arthritis. The cigarettes dispatched nicotine quickly to the brain. Nicotine acts on the brain to create desire to smoke in situations where smoking would normally occur. To start with, nicotine causes the brain to release adrenaline and creates Buzz of pleasure, and finally leads to displeasure.

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