Insights in Stem Cells
VOLUME-8



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Electronic Nicotine Delivery Systems (ENDS), also called as electronic cigarettes are highly addicting and potentially harmful products. E-cigarettes use, called vaping is popular among the youth. E-Cigarettes are available in many shapes and sizes, including the prominent brand JUUL, which re- sembles a flash drive and contains roughly the same amount of nicotine as in a pack of 20 cigarettes.

ENDS contains liquid nicotine, propylene glycol, and fla- vors to attract kids and youth. In India, E -cigarettes are un- approved under Drugs and Cosmetics (D&C) Act but are still available through e-commerce sites because of the lack of awareness and poor implementation of the law.

In the US too, the Surgeon General released an advisory on the e-cigarette epidemic among youth, in December 2018. As per US Surgeon General's advisory, Most e-cigarettes contain nicotine - the addictive drug in regular cigarettes, cigars, and other tobacco products. Nicotine exposure during adolescence can harm the developing brain - which continues to develop until about age 25. Nicotine exposure during adolescence can impact learning, memory, and at- tention. Many e-cigarettes also come in kid-friendly fla- vors. In addition to making e-cigarettes more appealing to young people, some of the chemicals used to make certain flavors may also have health risks. E-cigarettes can also be used to deliver other drugs, including marijuana. In 2016, one-third of U.S. middle and high school students who ever used e-cigarettes had used marijuana in e-cigarettes

Cigarette smoking rates among teens have dropped over the last few decades, but the use of ENDS also called vap- ing, has risen in this age group. There is ample scientific evidence available about the harmful health effects relating to the use of e-cigarettes, including cardiovascular and lung diseases.

Lung toxicity of ENDS: The E- cigarette aerosols contain very fine particles, heavy metals, organic compounds and heavy metals like nickel, tin and lead. Inhalation of aero- sol extracts causes DNA damage in lung cells. Inhalation of electronic cigarette aerosols leads to pulmonary inflamma- tion, impaired innate immunity, reduced lung function and changes consistent with chronic obstructive lung disease (emphysema) in pre-clinical animal models. Recently, anal- yses of broncho-alveolar lavage collected from nonsmokers, smokers and e-cigarette users clearly showed that electron- ic cigarette vapors exert marked and extensive biological effects on human airways, albeit different than tobacco smoke. Thus, regardless of the presence or absence of nico- tine, exposure to electronic cigarette aerosol in adolescence and early adulthood is not risk-free and can result in pulmo- nary toxicity

Contents of E-cigarettes: A study from the University of North Carolina found that the main ingredients found in e-cigarettes-propylene glycol, vegetable glycerin, and acro- lein-are toxic to cells. Acrolein can cause COPD, asthma and lung cancer

Second-hand aerosol exposure: The Surgeon General 2016 report concluded that secondhand emissions contain, nicotine; ultrafine particles, diacetyl, a chemical linked to serious lung disease; volatile compounds such as benzene and heavy metals, such as nickel, tin, and lead.

Bronchiolitis Obliterans or Popcorn Lung disease: The chemical that gave this condition its nickname is diacetyl. After workers at a factory that packaged microwave popcorn were found to have this ailment more often than other people, some companies stopped using diacetyl as a flavoring, but is still being used in some electronic cigarette flavors in the US

Harmful flavors in ENDS: About 8,000 e-liquid fla

vors have been reported. Cinnamon flavor had the strongest cytotoxic effect, followed by the menthol tobacco-flavored E-liquids E-cigarettes are not currently approved by the US FDA as a Tobacco cessation aid. The evidence is insufficient to recommend e-cigarettes for smoking cessation in adults. Currently it is banned for sale in about 25 countries Considering the harmful effects of ENDS/E-Cigarettes, many more countries are planning to highly restrict or alto- gether ban sales of these products.

## Biography

Rakesh Gupta is a President and Director of Public Health, Strategic Instt. for Public Health Education and Research (SIPHER), Ex-Director Health Services and Director of Chemical Examiner Lab, Govt. of Punjab, Chandigarh, India. In his 35 years of professional experience, he have more than 8 years Expertise in managing National Non-Communicable diseases Programmes especially Blindness Control/ Tobacco Control Programmes. He is the Alumni of John Hopkins School of Public Health, Baltimore and University of California San Francisco as a short term scholar. He received WHO Award 2015 on World No Tobacco Day. He has contributed significantly in many National/International Conferences. His abstracts accepted and presented in WLCs Barcelona 2014,Cape Town 2015,Liverpool 2016 and COPD Conference Tokyo-2018 .Abstracts accepted in WLC Guadalajara Mexico 2017 and WCTOH Cape town 2018.

## About the University

Strategic Institute of Public Health Education and Research (SIPHER) was established in 2018 under the Societies Registration Act (XXI of 1860), with a fundamental purpose of creating a specialised public health workforce who can plan, execute and monitor national health programs and public health initiatives for tackling emerging public health challenges. The institute was born in the era when there is a global human resource crisis which is a major impediment to achieving Universal Health Coverage. There are very few institutes in the country which imparts quality public health education. SIPHER aims at redeveloping and creating innovative modes of education and training programs to address the crisis and expanding efficient public health workforce. It is a unique institution which intends to provide trans-disciplinary, multi-sectoral trainings & recommendations to the government in order to overcome broader challenges in public health. The institute also undertake advocacy on various public health issues and carry-out policy-focussed research. The Institute has significantly contributed in the area of tobacco control and corneal blindness by organising consultations on protecting minors from the tobacco/nicotine, endorsing ban on ENDS/E-cigarettes and hospital cornea retrieval program. SIPHER has recently conducted a high-level consultation on increasing legal age to buy tobacco and legal nicotine products beyond 18 years and proposal sent to the governments.

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