Vol 6 | Issue 1 | 2016 | 54-56.

e-ISSN 2248 – 9142
print-ISSN 2248 – 9134

International Journal of
Current Pharmaceutical & Clinical Research

www.ijcpcr.com

ELECTRONIC CIGARETTES: A NEW CHALLENGE IN PUBLIC HEALTH

Manish Kumar[1*], Abhishek Haldia[2], Govind Lal Meena[3], Deepak Meena[4]

[1]Senior Resident, Department of Dentistry, S P Medical College, Bikaner, India.
[2]Assistant Professor, Department Of Pedodontics and Preventive Dentistry, Govt Dental College, Jaipur, India.
[3]Medical Officer, Uphc, Pratap Nagar, Udaipur, India.
[4]Medical Officer, Department of Dentistry, S P Medical College, Bikaner, India.

ABSTRACT

Electronic Cigarettes also called Electronic Nicotine Delivery Systems (ENDS) or personal vaporizers (PV) are a modern approach for smokers to get smoke-free nicotine. Electronic cigarettes have seen a rapid rise in usage since their introduction. A vigorous debate is currently underway in healthcare and regulatory circles with regards to how they should be received. These products with their advent have become popular among young adults, through social media. These products are considered as a "safer" method when compared to smoking. These have also been implemented to quit smoking cigarettes, and smoke in smoke free areas. However, these products have not yet been regulated by the US Food and Drug Administration (FDA), and less of scientific studies have come out with results showing its safety.

Key words: Cigarettes, Tobacco, Smoking cessation, Atomizer, E-cigarette.

INTRODUCTION

Use of electronic cigarettes, devices that deliver a nicotine-containin vapor, has increased rapidly across the country and globally. Use of electronic cigarettes (e-cigarettes), referred to as vaping, is a relatively new phenomenon that is quickly gaining the interest of many long-time tobacco smokers. E-cigarettes are becoming a preferred alternative for nicotine delivery among many smokers because of their realistic look, feel, and taste compared to traditional cigarettes. Furthermore, many cigarette smokers have turned to vaping because e-cigarette vendors have previously marketed their product as a cheaper and safer smokeless alternative to traditional cigarettes, and a possible smoking cessation tool [1].

The medical community must prepare itself to face the new challenge concerning e-cigarettes and vaping as a "harm reduction" tool. As a consequence of past lessons learned from "Big Tobacco" companies, the medical community is suspicious of e- cigarettes and has routinely advised against their use. The medical community advises on the side of caution, indicating that very little scientific evidence is available to show, one way or the other, that e-cigarettes are safe to use, or that they help in the smoking cessation process. In addition, many physicians fear that patients who vape are merely substituting one form of nicotine addiction for another. While there are certainly potential perils associated with vaping, smoking, the leading cause of preventable disease in the United States, is likely to be more dangerous than vaping, especially when considering the myriad of known toxins found in cigarette smoke and the diseases which they promote. Understandably, the medical community is concerned that increased availability of e-cigarettes could increase worldwide nicotine dependence, especially among the young as they are enticed by the various flavor options e-cigarettes have to offer. Since vaping does not produce smoke from burning tobacco, the opponents of e-cigarettes fear that traditional smokers will substitute vaping for smoking in settings where smoking is not permitted without any real intention of quitting conventional cigarettes.

Corresponding Author :- **Manish Kumar** Email:- drmanishagarwalmds@gmail.com

Furthermore, vaping in public places, coupled with recent e-cigarette commercials on national television, could possibly undermine or weaken current antismoking regulations. Health care professionals will need to consider and weigh what is more harmful to the public, continued smoking or increased nicotine addiction [2]. As e-cigarettes gain greater popularity among smokers, these challenges will undoubtedly occur with increasing frequency.

HISTORY

Development of an electronic smoking device was first made by Herbert A. Gilbert. In 1963, he devised a form of cigarette that used moist, flavoured air and replaced burning of tobacco. The mechanism involved heating of nicotine solution and thus producing steam [3]. Credits for the invention of the electronic cigarette go to Hon Lik who in 2003 used the idea of vaporizing liquid part containing nicotine by piezoelectric ultrasound emitting element. His device produced smoke like normal tobacco cigarettes and also aided in delivery of nicotine. Electronic cigarettes were first introduced to chinese market in the year 2004 as an adjunct in smoking cessation. These devices are mostly manufactured in china. With time, these smoking devices continued to evolve from the first generation three-part device. It was in the year 2006, when "cartomizer" was invented by British entrepreneurs Umer and Tariq Sheikh of XL Distributors. This basically involved heating coil into the liquid chamber.

This new device was launched in UK in the year 2007 in Gamucci Brand and since then, it has been adopted by other brands as well.

GLOBAL SCENARIO

There has been an increase in use of Electronic cigarette sales from 50,000 in 2008 to 3.5 million in 2012. As of 2011, one in every five adults who smoke has tried electronic cigarettes at least once in United States [4]. It was found that more than 12,000 adults, i.e. 11% of regular smokers have used electronic cigarettes and 24% had used them in the past, in a survey conducted in UK. In 2014 the number of people who had ever smoked who reported using electronic cigarettes was 52%. Among the students in the United states, those who had ever smoked an electronic cigarette rose from 3.3% in 2011 to 6.8% in 2012 [5]. There was a decrease in % of students smoking tobacco cigarettes; 7.5% to 6.7% among the United States students of class 6 to 12.

In 2014, a survey by French Monitoring Centre for Drugs and Drug Addiction on 2052individuals reported that between 7.7 and 9.2 million individuals have tried electronic cigarettes, with between 1.1 and 1.9 million using on a regular basis. 67% of those addicted to tobacco smoking used electronic cigarettes to reduce or quit the habit.562.+3 Internet marketing has been a common source of obtaining these forms of cigarettes. Over millions of users have purchased these cigarettes either as a safer alternative to traditional smoking or as first time smokers [6]. Around 27% of smokers have used electronic cigarettes to help them quit tobacco smoking. The role of e-cigarette in tobacco cessation is still at a dilemmatic stance. There is lack of reliable data that would support its beneficial effects.

CHEMICAL ANALYSIS OF E-CIGARETTE CARTRIDGES, SOLUTIONS, AND MIST

The ingredients found in e-cigarette cartridges and solutions are relatively few, and for the most part non-toxic and non- carcinogenic, especially in the low quantities delivered. They include nicotine, propylene glycol, glycerin, and tobacco flavoring. Propylene glycol, an FDA-approved solvent used in foods, a vehicle for intravenous diazepam, and as the major ingredient found in e-cigarette fluids, makes up about 90% of the solution. Certain contaminates, most of which are derived from tobacco flavoring, have been detected in e-cigarettes. A small amount of diethylene glycol (approximately 1%), a known carcinogen and an ingredient in anti-freeze, was also detected in one out of 18 cartridges analyzed by the FDA. The source of the diethylene glycol contamination is not clear but could reflect the use of non-pharmaceutical grade propylene glycol [7]. In comparison, cigarette smoke from burned tobacco products contains thousands of compounds, many of which have been shown to induce or promote carcinogenesis specifically the tracemetals (i.e., cadmium, arsenic, chromium, nickel, and lead), the tobacco specific N-nitrosamines (TSNA), the polycyclic aromatic hydro- carbons (PAHs), and the volatile organic compounds (VOCs). While investigations have shown some of these hazardous com- pounds to be present in e-cigarette cartridges, solutions, and mist, there are only a few reports detecting levels of these contaminates high enough to be of significant risk to humans [8].

MECHANISM OF ACTION

The mechanism of action of Electronic cigarette is quite simple. It works by vaporising nicotine liquid, that are contained in cartridges. These devices consist of rechargeable battery that powers the atomiser playing role in heating the cartridge ingredients to create a vapour that is inhaled by the consumer [9]. These devices are tobacco free. There is no combustion and hence are smoke-free and odourless as well. Electronic cigarettes are like tobacco cigarettes in form, use and nicotine sensation. When breath is drawn back, visible vapour is produced and the LED fit to the device lights up, thus mimicking the usual cigarette.

REASONS FOR USING E-CIGARETTES

Electronic cigarettes are primarily used for two reasons: As an alternative to smoking and as a smoking cessation aid. According to the ITC Four-Country Survey, almost 80 percent of respondents used e-cigarettes to reduce the health risks of tobacco smoking and three

quarters of respondents stated using them to help them quit smoking [10]. In an international survey conducted on the Internet with participants from 33 countries, 76 percent of participants stated using electronic cigarettes as an equal alternative to smoking. Further reasons reported included: the desire to quit smoking (7 percent), health reasons (6 percent), costs (3 percent) and avoiding smoking bans (3 percent).

CONCLUSION

Despite the popularity e-cigarettes have gained worldwide, very little rigorous research has been done regarding the effects these devices have on human health. When compared to the harmful effects of smoking, these studies suggest that vaping could be used as a possible "harm reduction" tool. There is evidence supporting e-cigarettes as an aide for smoking cessation, at least as successful as currently avail- able FDA-approved NRTs. Less evidence exists to suggest that e-cigarettes are effective in recovery from nicotine dependence. More rigorous research is essential before any solid conclusions can be drawn about the dangers, or usefulness of e-cigarettes. In particular, more rigorous research is required delving into both acute and long-term cardiopulmonary effects of vaping, especially those experiments comparing the effects of vaping with those of smoking. E-cigarettes are fast becoming a new "tobacco" industry that could reduce the incidence of traditional smoking. It is also possible that e-cigarettes may either decrease or increase the incidence of nicotine addiction. Given these uncer-tainties, will the availability of e-cigarettes provide for healthier U.S. and world populations, as harm reductionists hope, or will other more dangerous ill effects ultimately emerge. Health care professionals must remain current with the literature concerning e-cigarettes and vaping. Only then can they make informed decisions aimed at maximizing human safety and minimizing the potential ill effects e-cigarettes may have on their patients and the public.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST:
The authors declare that they have no conflict of interest.

REFERENCES

1. Dawkins L, Turner J, Roberts A, Soar K. 'Vaping' profiles and preferences: an online survey of electronic cigarette users. *Addiction*, 108, 2013, 1115–1125.
2. Vansickel A, Eissenberg T. Electronic cigarettes: effective nicotine delivery after acute administration. *Nicotine Tob Res*, 15, 2013, 267–270.
3. McAuley TR, Hopke PK, Zhao J, Babaian S. Comparison of the effects of e-cigarette vapour and cigarette smoke on indoor air quality. *Inhal Toxicol*, 24, 2012, 850–857.
4. Rennard SI, Glover ED, Leischow S, Daughton DM, Glover PN, Muramoto M. Efficacy of the nicotine inhaler in smoking reduction. A double blind,randomized trial. *Nicotine Tob Res*, 8, 2006, 555–564.
5. Stead LF, Perera R, Bullen C, Mant D, Hartmann-Boyce J,Cahill K. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev*, 11, 2012, 153-157.
6. Hughes JR, Keely J, Naud S. Shape of the relapse curve and long term abstinence among untreated smokers. *Addiction*, 99, 2004, 29–38.
7. Siegel MB, Tanwar KL, Wood KS. Electronic cigarettes as a smoking-cessation tool: results from an online survey. *Am J Prev Med*, 40, 2011, 472–475.
8. Bullen C, Howe C, Laugesen M, McRobbie H, Parag V, Williman J. .Electronic cigarettes for smoking cessation: a randomised controlled trial. *Lancet*, 13, 2013, 42-45
9. Bullen C,Newcombe R,Walker N,Walton D.The use and acceptabil- ity of electronic cigarettes among New Zealand smokers. *N Z Med J*, 126, 2013, 48–57.
10. Cobb NK, Abrams DB. E-cigarette or drug delivery device. Regulating novel nicotine products. *N Engl J Med*, 365, 2011, 193–195.