

Perspective Article

The Burning Question of e-Cigarettes: A Pulmonologist's Perspective

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Fifty years have passed since the 1964 Surgeon general's report on Smoking and Health, and now public policy makers and public health advocates have a new target in their sites. Electronic cigarettes or e-cigarettes (aka vaping) have been in the news for the past few years with vigorous debate about their use and potential as a gateway to tobacco smoking, as well as their potential for aiding smoking cessation efforts. There has been ongoing arguments over the potential need for regulation by the US Food and Drug Administration, while some state and city governments have already set out to ban their use in public places, much the same way tobacco smoke is banned. Add to the mix, a strong distrust of the tobacco companies and tobacco lobby due to their long history of stonewalling and duplicitous dealings and we have a full-blown potential health crisis. On one side of the debate, are those who feel that e-cigarettes are an effective aid for smoking cessation and on the other side are those who seek restriction and legislation to limit the realization of what they fear may result in the "renormalization" of smoking. Unfortunately lost in all the noise is a lack of good research or science to support many of the contentions on either side.

Here is what we know so far about e-cigarettes and why the rhetoric may have outpaced any evidence of harm in their use.

A report from the Centers for Disease Control and Prevention for the years 2011-2012 show that current use of e-cigarettes doubled among middle and high school females, middle school males, and Hispanic high school students; was slightly less than double among non-Hispanic white high school students; and increased more than 60% among high school males [1]. What the data does not show is that there has been a consequent rise in the amount of cigarette smoking [2]. Opponents of e-cigarettes are quick to point out that vaping, a seemingly innocuous term, hides the true health dangers of e-cigarettes. One of the primary ingredients in e-cigarettes and the part with the addictive potential is nicotine. It should however be noted, that nicotine is generally not thought of to be particularly toxic, though some more recent studies have shown it to be carcinogenic in animals [3]. 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 [4]. They include nicotine, propylene glycol, glycerin, and tobacco flavoring. The larger health concern has arisen over byproducts including

diethylene glycol, trace metals, and tobacco-specific nitrosamines. There is data to show that for most of these, levels found in tobacco smoke are higher than those in e-cigarette vapor [5]. Although the data is sparse and vaping is a relatively recent phenomenon, there has not been data documenting any specific harm for the "smoker" of e-cigarettes nor for someone inhaling "second-hand vapors". The concern for toxic chemicals can likely be addressed by regulation and quality control by a governmental entity, such as the FDA.

The next major question is, can vaping help smokers quit use of cigarettes? the simple answer is yes, as has been demonstrated in most studies using e-cigarettes as a smoking cessation aid [5]. At the end of 6 months, Polosa et al. found that vaping e-cigarettes decreased consumption of conventional cigarettes by 80% after 6 months [6] and 50% after 24 months [7]. Caponnetto et al. reported similar reductions in cigarette consumption and cigarette abstinence after a year-long trial of using e-cigarettes in both normal smokers [8] and in chronic schizophrenic smokers [9,10] bullen et al. Demonstrated that at 6 months, 21 of 289 (7.3%) participants in the nicotine e-cigarettes group had achieved biochemically verified abstinence, compared with 17 of 295 (5.8%) participants in the nicotine replacement patch (NRT) group (risk difference for nicotine e-cigarette vs. patches 1.51 [95% CI -2.49 to 5.51]). 57% of participants in the nicotine e-cigarette group had reduced tobacco cigarette consumption by at least half at 6 months, compared with 41% of those in the patches group (p=0.0002) and e-cigarettes received higher user endorsement than patches. The study was underpowered, so it was unable to conclude superiority of nicotine e-cigarettes to patches or to placebo e-cigarettes. Once again opponents of e-cigarette use, spin this study to show that e-cigarettes have not been shown to be more effective than NRT, a group of products whose safety and efficacy has been established over many years of use.

As noted above, some public health advocates are primarily concerned about the erosion of the "denormalization" of smoking in society, with a consequence of possible increased use of combustible tobacco products by teenagers. They are also concerned about the public health risks from the e-cigarette vapors and are (rightly) suspicious of big tobacco companies who have entered this market and stand to reestablish their market dominance. While these concerns may be valid, at this point in time none of these risks have been realized and, in fact, the little evidence we have seriously questions these arguments. Rather than regulate and demonize smokers who want to quit, or at least cut down combustible tobacco use with an e-cigarette and potentially improve the overall global health, many public policy makers have chosen to dig in their heels and ban vaping in public spots.

The FDA should rightfully regulate these products as smoking cessation aids and researchers should continue testing these devices for safety and efficacy. However, the constant barrage of negative

messages and continued harassment of “vapers”, confining them in outside areas with combustible tobacco smokers will lead to missed opportunity and recidivism. If we give smokers what they want, by delivering the “habit” aspect of cigarette smoking, the sensation of smoking, and the physiological effects of nicotine many of them will likely be able to break away from the known hazards of tobacco smoke. Although a complete elimination of tobacco both conventional and nonconventional is an ideal stated goal, the reality is that it is not likely to happen, as can be evidenced by the scourge of alcoholism and illicit drug abuse. It may be wiser to set our sights on a more reasonable goal of harm reduction by achieving a marked decrease in combustible smoking, and not eliminating what has the potential to be a true game changer in the fight against tobacco use.

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