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Reduced nicotine content cigarettes, e-cigarettes and the cigarette end game

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Abstract

The reduced nicotine content cigarette and the emergence of non-combusted nicotine products like e-cigarettes should be viewed not as alternatives but as complementary components of regulatory interventions that could virtually end combusted tobacco use.

Keywords

Addiction; alternative nicotine delivery systems; cigarette end game; electronic cigarettes; nicotine; reduced nicotine cigarettes

The devastating health consequences of tobacco use are caused primarily by exposure to combustion products of tobacco, driven by addiction to nicotine. The most important goal of tobacco control should be the reduction or elimination of the use of combusted tobacco. Two approaches to reducing or eliminating the use of combusted tobacco products have been discussed widely in the tobacco control community. One is a regulatory policy that reduces the nicotine content of cigarettes to minimally or non-addictive levels [1,2]. Nicotine reduction would lower the level of tobacco dependence, promote cessation of cigarette smoking and probably prevent transition from experimental to addictive smoking among smoking initiates. The public health benefits of nicotine reduction have been modeled with the conclusion that the impact on reducing morbidity and mortality would rival that of water sanitation [3]. The feasibility of reducing the nicotine content of cigarettes to reduce nicotine dependence has been demonstrated: nicotine intake can be reduced substantially with

Declaration of interests

N.L.B. serves as a paid consultant to pharmaceutical companies that are developing or that market smoking cessation medications. He also has been a paid expert witness in litigation against tobacco companies, including on issues related to light cigarettes. The other authors have no competing interests to declare.

minimal symptoms of nicotine withdrawal and without evidence of compensatory over-smoking [2,4]. The proposal to reduce the nicotine content of cigarettes has been recommended recently for consideration by the World Health Organization Study Group on Tobacco Product Regulation [5]. The other approach is to promote the use of non-combusted forms of nicotine instead of cigarettes, as recommended recently by the Royal College of Physicians in the United Kingdom [6]. The sources of nicotine could be nicotine medications or, more popular among smokers, electronic cigarettes (e-cigarettes). Non-combusted nicotine products deliver substantially lower levels of toxicants than combusted tobacco and consequently would result in less harm to health, particularly if smokers were able to substitute completely non-combusted for combusted nicotine products.

These two approaches are usually discussed independently and sometimes antithetically. Most studies of reduced nicotine content cigarettes have not provided access to alternative non-combusted nicotine products (ANDS). Conversely, the primary focus of those advocating using ANDS has been to provide smokers with products that could substitute for conventional cigarettes (harm reduction). We believe that the combination of these two approaches is likely to have the greatest impact upon public health.

Electronic cigarettes deliver a nicotine-containing vapor that is inhaled like a cigarette, with some devices resulting in rapid pulmonary absorption similar to a cigarette. Most e-cigarettes are flavored, which may also attract smokers and potential smokers. A recent report from the Royal College of Physicians in the United Kingdom concluded that e-cigarettes and other ANDS could reduce harm from smoking radically, and proposed that the use of ANDS be considered as part of a national tobacco control policy. In the United Kingdom, the authors argue, e-cigarette use enhances the likelihood of quitting cigarettes and there is little evidence that youth transition from e-cigarette to cigarette use [6].

Important considerations in nicotine reduction include the acceptance of a reduced nicotine cigarette (RNC) intervention by smokers and the need to replace the nicotine that smokers gain normally from conventional combusted cigarettes. Clinical trials of nicotine reduction have found that smokers do not like RNC cigarettes as much as conventional cigarettes and that, in the context of freely available regular cigarettes, non-compliance with smoking RNC cigarettes is common [2,4]. However, most non-compliant smokers smoke few conventional cigarettes per day, so nicotine exposure is still reduced markedly. These results indicate that smokers who switch to RNC cigarettes are likely to seek alternative sources of nicotine. Another concern is that smokers would react negatively to nicotine reduction, perceiving the policy as a form of prohibition.

The key to successful cigarette nicotine reduction is likely to lie with providing readily available, consumer-acceptable non-combusted forms of nicotine to support shifting the source of nicotine from cigarettes to a non-combusted product. Non-combusted nicotine could be used to manage withdrawal symptoms, to provide smokers with a viable alternative to cigarettes and to make it clear that nicotine reduction is not nicotine prohibition.

A mandatory reduction in the nicotine content of combusted products would address some of the considerable controversy that surrounds ANDS and as raised by the Royal College

of Physicians report. Arguments against promotion of e-cigarettes include concerns that e-cigarettes may have long-term negative health effects (although most agree much less than from cigarette smoking); will attract youth and serve as a gateway to cigarette smoking; will be used mainly along with cigarettes and that such dual use will result in lower cigarette quit rates; will re-normalize nicotine use and cigarette smoking; will undermine smoke-free air legislation; and may divert smokers from proven smoking cessation treatment services. With a mandatory reduction of nicotine in combusted products, concerns that e-cigarettes would be a gateway to addictive cigarette use would be obviated because RNC cigarettes would have low addiction potential. Regulations could be put in place to minimize the uptake of ANDS by youth and others who are naive to tobacco use. Dual use would be less of a problem because cigarettes would be less desirable, and e-cigarettes more satisfying in comparison. The other concerns would also become less relevant in a world with non-addictive cigarettes.

We believe that regulatory decisions on e-cigarettes must consider a potential complementary role of e-cigarettes and cigarette nicotine reduction. For most smokers, e-cigarettes are not as satisfying as conventional cigarettes and are unlikely to out-compete cigarettes in the open market. In the United States the number of smokers who are quitting conventional cigarettes in favor of e-cigarettes remains small. However, when faced with RNC cigarettes, many smokers may be motivated to quit smoking and for those smokers who continue to seek nicotine, e-cigarettes are likely to be perceived as the most acceptable alternative to smoking. In smoking cessation clinical trials, smokers preferred e-cigarettes to nicotine patches. To facilitate the transition from combusted to non-combusted forms of nicotine, we recommend that regulations regarding e-cigarettes and other ANDS focus on toxicity, safety and limiting youth uptake, but do not disrupt features that make them viable alternative to cigarette smoking. The RNC cigarette and the emergence of non-combusted nicotine products such as e-cigarettes should be viewed not as alternatives, but as complementary components to national interventions that could virtually end combusted tobacco use.

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