Acrolein Levels in e-Cigarettes—Letter

The recent article by McRobbie and colleagues (1) is the first prospective study addressing toxicologic exposure directly in e-cigarettes (EC) users. This study adds key information about harm potential of e-vapor products and gets away from the controversial toxicologic findings that have been generated in recent laboratories studies because of experimental protocols that do not mimic realistic condition of use (2). Given that the debate over the potential benefits and harms of ECs remains unproductive (3), it is imperative to shift toxicologic evaluation directly into the human body.

The study not only shows that urinary and exhaled breath toxicants generated by combustion (i.e., acrolein and carbon monoxide) are of several order of magnitude lower after switching to regular EC use, but that an important decrease is also observed in dual users (i.e., consumers who combine ECs and conventional cigarettes use) that have substantially reduced their daily cigarette smoking. Smokers should be informed that substitution of cigarettes with ECs exposes them to only a fraction of toxicants compared with tobacco cigarettes and that switching to less harmful form of nicotine delivery may have long-term beneficial health effects (4).

Nonetheless, the data presented by McRobbie and colleagues are not conclusive due to the small sample size and the restricted toxicologic evaluation (limited to only two toxicants). Moreover, changes in biomarkers of exposure (BoE) may not be uniform. For example, although a significant decrease in acrolein has been reported after use of reduced risk tobacco products, substantial increases were seen in BoE levels for fluorene and naphthalene in the same study population (5).

Most importantly, it must be emphasized that significant reductions in BoEs do not automatically imply risk reduction or harm reversal. Despite decreased overall BoE, switching to the reduced risk tobacco products failed to demonstrate consistent reductions in biomarkers of biologic exposure (BoBE). This general lack of response in BoBE levels to a reduction in toxicant exposure has been highlighted in a similar study by Sarkar and colleagues (6) who reported no significant changes in selected cardiovascular disease–related BoBE following a forced switch from a conventional cigarette to a cigarette containing activated carbon in the filter.

Future studies on ECs will have to expand the panel of BoE and to integrate data from biomarkers of biologic/physiologic effects.

Riccardo Polosa
Massimo Caruso
Pasquale Caponnetto

Received October 3, 2015; accepted October 19, 2015; published OnlineFirst November 10, 2015.

References
Acrolein Levels in e-Cigarettes—Letter


Updated version Access the most recent version of this article at: doi:10.1158/1940-6207.CAPR-15-0356

Cited articles This article cites 6 articles, 1 of which you can access for free at: http://cancerpreventionresearch.aacrjournals.org/content/9/1/115.full#ref-list-1

E-mail alerts Sign up to receive free email-alerts related to this article or journal.

Reprints and Subscriptions To order reprints of this article or to subscribe to the journal, contact the AACR Publications Department at pubs@aacr.org.

Permissions To request permission to re-use all or part of this article, contact the AACR Publications Department at permissions@aacr.org.