Cutting nicotine key to helping smokers quit

September 30 2015

Credit: Vera Kratochvil/public domain

Two decades after a UCSF researcher proposed that reducing nicotine in cigarettes as a national regulatory policy might facilitate quitting, a new study he co-authored has added to a body of evidence that indicates that doing just that may accomplish this goal. The study follows 2009 legislation that allows the Food and Drug Administration to limit the amount of nicotine in cigarettes.

In a 1994 commentary published in the *New England Journal of*

Medicine, Neal Benowitz, MD, a professor in the UCSF Departments of Medicine and Bioengineering and Therapeutic Sciences, suggested that by systematically cutting nicotine to levels that are not addictive, smokers could be weaned off cigarettes. The reduction could also prevent novice smokers from becoming addicted, he said.

In the new study, published October 1, 2015 and also published in the *New England Journal of Medicine*, co-author Benowitz and lead author Eric Donny, PhD, of the Department of Psychology at the University of Pittsburgh, explored this strategy by comparing smokers' consumption of cigarettes with varying amounts of nicotine.

In the study, the researchers recruited 840 smokers with no imminent plans to quit and assigned them to their usual brand of cigarette, or to those with nicotine contents ranging from 15.8 mg per gram of tobacco, equivalent to the level in commercial cigarettes, down to 0.4 mg.

Participants were told to report the number of cigarettes smoked each day over six weeks, via an interactive voice response telephone system. Withdrawal symptoms, addiction levels, depression and cravings were assessed, and urine and cigarette puff tests were conducted to gauge nicotine exposure and inhalation levels.

"There was concern that participants who reduced cigarette intake would 'oversmoke' cigarettes as a compensatory measure, but the study did not find this," said Benowitz.

When smoking patterns were examined at six weeks, the researchers found that the average number of cigarettes smoked per day was about 25 percent lower than the groups that smoked cigarettes with 2.4, 1.3 and 0.4 mg of nicotine. Those smoking the 5.2 mg consumed an average 20.8 cigarettes per day, approximately the same as those that smoked the 15.8 mg or their regular brands. Lower levels of nicotine intake were

reflected in urine tests. Participants assigned to 0.4 mg cigarettes were twice as likely to report attempts to quit, than those assigned to the 15.8 mg cigarettes.

Additionally the lower-nicotine smokers reported less dependence and cravings. Adverse events were generally mild and similar for smokers in all groups.

"This study shows in a large group of smokers not interested in quitting that reducing the nicotine content of cigarettes reduces nicotine intake substantially, without leading to an increase in the number of cigarettes smoked to compensate," said Benowitz.

"It provides strong evidence that nicotine reduction will reduce tobacco dependence without safety concerns, such as increasing inhalation. This study supports the argument for an FDA-mandated reduction in the nicotine content of cigarettes."

Future research will focus on the effectiveness of immediate nicotine reduction versus a gradual tapering, and the use of a transdermal patch in tandem with low-nicotine cigarettes.

Approximately 18 percent of American adults smoked in 2013, according to the latest figures from the Centers for Disease Control and Prevention.

The Tobacco Control Act of 2009 grants the FDA authority to reduce but not eliminate nicotine, if long-term benefits to public health are demonstrated.

Provided by University of California, San Francisco