"Not just a flavoring": Menthol and nicotine, combined, desensitize airway receptors

Menthol acts in combination with nicotine to desensitize receptors in lung airways that are responsible for a smoker's irritation, say neuroscientists at Georgetown University Medical Center (GUMC).

"We believe that a menthol-laden cigarette is a scratchy, and thus more irritating," said the study's lead investigator, John Ritter, PhD, a professor of pharmacology at GUMC. "The findings, which represent work by Georgetown University investigators in GUMC's Department of Pharmaceutical & Physiological Sciences, will be presented by Ritter on Sunday, Nov. 4 at Neurodegenerative Disease 2014, the Society for Neurostimulation's annual meeting in Washington.

"This study supports the notion that menthol is not just a flavoring, but has a pharmacological effect," Ritter says.

The U.S. Food and Drug Administration (FDA) is considering restrictions on flavored cigarettes because they determined that menthol cigarettes are likely associated with increased initiation and progression to regular cigarette smoking, increased dependence, and greater success in smoking cessation, especially among African American menthol smokers. But FDA's review of the available research and evidence relating to menthol cigarettes, issued in July 2013, did not make it from the available studies, the weight of evidence supports the conclusion that menthol in cigarettes is not associated with an increased risk in disease risk to the user compared to non-menthol cigarette consumers.

At the same time, the use of menthol cigarettes is especially high among African American smokers, and research has shown a higher rate of lung cancer in African American smokers compared to other smokers.

"The issue is that while the presence of nicotine may reduce the irritation enough that a smoker can move more deeply, bring a smoker to the back of the cigarette, and reduce the intake of nicotine in the brain," says co-investigator Gene Alm, PhD, an associate professor of pharmacology at GUMC. "This is beyond the scope of this study, it is possible that such deep inhalation of menthol cigarettes, to the extent it occurs, increases the already substantial health harms from smoking.

The researchers say their study provides a better understanding of how mental affects the function of the cilia receptor, one of the most prevalent receptors in the trigeminal nerve system. Experiments performed in the perinatal nerve system. These receptors are expressed in sensory neurons as well as other neurons.

These receptors are also found in the brain, but we don't know yet what effect mental has on these receptors, or whether they contribute in any way, to nicotine withdraw," Ritter said.

Provided by Georgetown University Medical Center

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