

Cigarette after Valentine snuggle deadlier for some

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The proverbial cigarette after a Valentine's Day snuggle can prematurely end a love affair, as new evidence emerges that a common defect in a gene significantly increases a smoker's risk of an early heart attack. Researchers say that as much as 60 to 70 percent of the population has a gene defect that delivers a one-two punch to smokers: In a recent published study, heavy smokers with this common gene variant experienced a heart attack around the age of 52.

“We've all heard the stories: Someone's great-uncle has smoked three packs of cigarettes since he was 14, and now, at the age of 88, he's living a fine, healthy life,” said Arthur Moss, M.D., director of the Heart Research Follow-up Program at the University of Rochester Medical Center. “Contrast that with the 52-year old neighbor, who also was a heavy smoker, and just last week, dropped dead from a heart attack. Why is it that some smokers seem unaffected by their habit and even outlive the healthiest individuals, while many other smokers suffer significant cardiac events at a relatively young age? We think we now know why.”

According to Moss, the answer lies in a common deviation of the gene CETP (cholesteryl ester transfer protein), a protein found in all people that controls cholesterol metabolism. Smokers with a common form of this gene are likely to suffer a heart attack 12 years earlier than a non-smoker, while smokers who do not carry this variant appear to be “protected” and have the same risk of heart attack as non-smokers.

While genes have long been linked to diseases, it's only been recently that researchers have been able to begin unraveling the intricate interplay between genes and the environment. By understanding how certain environmental factors such as diet, chemicals and even smoking can influence how well – or not – a particular gene works, scientists hope to provide new approaches to help decrease a person's risk of disease.

In this case, researchers zeroed in on CETP, which manages a person's level of high-density lipoproteins (HDL), the "good cholesterol." Unlike low-density lipoproteins (LDL), which build up plaque on artery walls and predispose a person to heart attacks or strokes, HDL helps filter LDL out of the blood and chips away at the plaque lining artery walls.

When CETP has a common defect, it makes the protein controlling HDL work on overdrive. This overactive protein more furiously "attacks" HDL, breaking it into smaller particles that are more easily cleared from the blood, leading to decreased HDL levels – and less good cholesterol.

"It's this efficient removal of HDL caused by the CETP gene defect that puts people at higher risk of an early onset of heart disease," said Moss. "The problem only gets worse for smokers who have this form of CETP, because smoking is known to also lower HDL levels. The cumulative effect is a dramatic drop in the age such smokers are likely to experience a heart attack – about a dozen years earlier than someone who also has the variant but does not smoke."

Moss added that the research also helps explain why some heavy smokers appear to beat the odds when it comes to heart disease.

"If you're a smoker and you don't carry the CETP variation, you have the same risk for heart disease as a non-smoker carrying the same gene," he said. "These smokers can thank their lucky genes for not suffering heart attacks at a young age."

Moss' conclusions are based on patients enrolled in the THROMBO Study, a multi-center trial that collected blood samples and medical histories from patients who had suffered their first heart attack in the 1990s. Researchers were able to retrieve frozen blood samples from 814 study participants to determine if they had the CETP gene deviation. Other interesting findings concerning smokers include:

-- How much you smoke impacts your risk: Researchers found that heavy smokers – those who smoke more than one pack a day – are likely to suffer heart attacks about 12 years earlier than nonsmokers; for those who smoke less than one pack a day, the age difference is only six years.

-- Smokers can recover lost ground within one year of quitting. Those who had smoked more than one pack a day gained about four years within one year of quitting, while those who had smoked less than one pack a day gained about six years.

Moss believes his work touches on a theme that is becoming more prevalent in all fields of medicine.

“When we were younger, we learned how genes gave us a certain hair or eye color. But we are increasingly finding that our ability to untangle a person's genes can help us understand why some get certain diseases and some don't. I wouldn't be surprised if there's a similar gene variation that predisposes some smokers to other diseases, such as lung cancer,” he added.

The study was published recently in the *Annals of Noninvasive Electrocardiology*.

Source: University of Rochester

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