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Smoking Plus Nutrition Bring About Oral Cancer

Scientists try to unlock the mechanisms of oral cancer and how smoking and nutrition influence the incidence of this type of cancer

Even though medical experts have found for some time now that the incidence of tobacco smoking in patients diagnosed with oral cancer is extremely high, they did not know for sure how smoking can lead to this type of cancer. This is why scientists have recently carried out a study in order to track down the exact mechanism of oral cancer and how it is caused or enhanced by smoking.But researchers did not limit their investigations to the connection between smoking and oral cancer. They also studied the importance of nutrition and how certain compounds in foods we eat daily can promote the development of mouth cancer. In this concern, scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (USDA HNRCA) at Tufts University have investigated the relationship among smoking, folates and certain antioxidants and oral cancer.The study was carried out on 56 men and women with ages ranging from 30 to 80. Researchers analyzed the subjects' diets and also studied their blood and cheek cells. Half of the participants in the study were heavy, chronic smokers (they were found to have been smoking at least 10 cigarettes per day for at least the past year.)Folate is a B vitamin which protects against cancer and malignant tumors and promotes health in our bodies. It is usually contained in green leafy vegetables and fortified foods. When testing the bodies of chronic smokers in the study, researchers found that they presented lower levels of folate than their non-smoking counterparts. Tests also showed that cheek cells in heavy smokers had far more genetic aberrations and deformations than the same type of cells in non-addicted individuals. The aberrations of cheek cells are known as micronuclei and are an early sign of mouth cancer. Joel Mason, MD, director of the USDA HNRCA's Vitamins and Carcinogenesis Laboratory and leader of the study commented on the findings: "Regardless of dietary intake, smokers had lower levels of folate in both blood and cheek cells, compared with non-smokers. It's possible that diminishing folate in cells may cause the cellular milieu to change, inducing the formation of cancerous cells."However, researchers involved in the study cannot say for sure if low levels of folate found in smokers represent the key factor that leads to oral cancer: "our observations do not support a mechanistic role for folate in development of oral cancer. However, they do not exclude a potential protective role of adequate folate intake or supplementation. Additional studies are clearly needed to elucidate mechanisms responsible for the observed shifts in folate form distribution due to smoking."Dr. Mason also points out that the genetic aberrations in cheek cells of heavy smokers may not be caused by low folate levels: "based on our findings, it does not appear that folate depletion induced by smoking is a major avenue for the formation of the genetic aberrations (micronuclei) that increase risk of oral cancer. Oral micronuclei and low oral folate are each linked with smoking, but they were not related to each other in this study."A similar study investigating the connection among smoking, vitamin E and carotenoids levels and mouth cancer was conducted by Elizabeth Johnson, PhD, scientist in the Carotenoids and Health Laboratory at the USDA HNRCA and colleagues. Results showed that levels of carotenoids in non-smokers' blood and cheek cells were correlated. Namely, if non-smokers presented high levels of carotenoids in blood cells, they also had high carotenoids levels in cheek cells and vice versa. But this correlation of carotenoids was not found in smokers, possibly due to the fact that tobacco alters the distribution of some nutrients in one's body. Vitamin E levels also found dissimilar in smokers and non-smokers. Smokers presented higher levels of a certain form of vitamin E in their bodies, called gamma-tocopherol. On the other hand, non-smokers presented higher levels of another form of vitamin E, alpha-tocopherol, which

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is more easily absorbed in the body than the gamma-tocopherol form. "We can only speculate, but perhaps this is a protective mechanism in which one form of the antioxidant vitamin goes up when another goes down," Elizabeth Johnson stated."So, although our results do not support a direct role for these nutrients in oral carcinogenesis, we uncovered some interesting relationships between smoking and nutrient distribution that deserve further exploration," the team concluded.

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