

## Researchers find smoking is strongly associated with squamous cell carcinoma among women

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Women who have non-melanoma skin cancers are more likely to have smoked cigarettes compared to women without skin cancer, said researchers at Moffitt Cancer Center in Tampa, Fla., who published study results in a recent issue of *Cancer Causes & Control*.

The study investigated the relationship between cigarette smoking and non-melanoma skin cancers, including basal cell carcinoma (BCC) and squamous cell carcinomas (SCC). Smoking histories were assessed and compared between patients diagnosed with BCC and/or SCC, and a group of controls comprised of patients who were screened for skin cancers, but who were not diagnosed with and had no history of skin cancer.

The study's 698 participants were recruited through Moffitt's Lifetime Screening and Prevention Center and the University of South Florida's Dermatology and Family Medicine Clinics. Participants were asked about their smoking behaviors in terms of years smoked, how many cigarettes per day they smoked, and when those who once smoked quit smoking. The results were stratified by sex.

Study results showed that cigarette smoking was associated with non-melanoma skin cancer overall, and that the risk increased with numbers of cigarettes per day, total years of smoking, and pack-years smoked. Associations were particularly strong for SCC, with SCC being more

than two times as likely in those who have smoked for 20 or more years compared to controls.

"Among men, positive associations with smoking of equal magnitude were observed for BCC and SCC, although none of the associations were statistically significant," said Dana E. Rollison, Ph.D., study lead author and an associate member in the Moffitt Department of Cancer Epidemiology. "However, among women, smoking was not associated with BCC, while highly statistically significant associations were observed with SCC. Women with SCC were almost four times more likely than controls to have smoked for 20 or more years."

The researchers concluded that:

- Cigarette smoking was associated with non-melanoma [skin cancer](#), and the risk increased with increasing dose (cigarettes per day) and number of years smoked.
- Among men, smoking was modestly associated with BCC and SCC.
- Among women, smoking was strongly associated with SCC, but not BCC.

Why women smokers should be more likely than men to be diagnosed with SCC is not clear, said the researchers.

"Observations from the lung cancer literature may provide possible explanations for why smoking was a higher risk factor for SCC in women," wrote Rollison and co-authoring colleagues both at Moffitt and across USF's College of Medicine. "Female current smokers have higher lung cancer risks than men. Women have been shown to have more active CYP enzyme activity in the lung, where CYP is responsible for metabolizing 70-80 percent of nicotine. In addition, the up-regulation of

CYP by estrogen may play a role."

Also, [women](#) have been shown to have higher levels of DNA adducts and lower levels of DNA repair in the lung as compared to men, said Rollison.

"Further study is needed to shed more light on the sex-based differences and the role of [smoking](#) in non-melanoma skin cancers," concluded Rollison.

Provided by H. Lee Moffitt Cancer Center & Research Institute

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