

# Risk of Oral Squamous Cell Cancer is Lower in Persons with Allergies

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A history of allergies is associated with a lower risk of some cancers (including cervical, esophageal, laryngeal, colorectal) and possibly a higher risk of others (bladder, prostate). Allergies represent a hyperactivation of the immune response and involve infiltration by immune cells. A history of allergies may be associated with a lower cancer risk because of heightened immune surveillance, or because of the effects of allergy symptoms themselves. Such symptoms may expel cancer causing agents from the body, or may result in behavior modifications which reduce exposure to such agents. Few studies have investigated the relationship between a history of allergies and oral squamous cell carcinoma (OSCC). Of those, some failed to account for human papilloma virus (HPV) infection, which is a cause of some cancers and which may be associated with both OSCC risk and a history of allergy.

Dr. Marni Stott-Miller and colleagues in the Public Health Sciences Division tested the hypothesis that oral squamous cell carcinoma (OSCC) risk is lower in persons with a history of allergies. They also accounted for evidence of HPV infection, which they hypothesized would correlate with a weaker immune response (i.e. fewer allergies) and with increased OSCC risk. This is also the first study to distinguish between different types of allergens in OSCC, which may contribute toward our understanding of potential biological mechanisms.

Investigators included WA state residents who were diagnosed with OSCC between 1985-1995, between the ages of 18-65 years (n=400). They used random digit telephone dialing to recruit a comparison (control) group of persons of similar age and sex with no history of oral cancer (n=613). Participants answered questions about demographics, lifestyle, and medical factors prior to the reference date. (For OSCC cases, this was the date of diagnosis; for controls a date was randomly assigned in a similar distribution to the cases' diagnosis dates.) Investigators used logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs), and accounted for differences in age, sex, race, education, and history of smoking and alcohol use. Some analyses also accounted for differences in HPV infection status, and OSCC tumor site.

Cases were, on average, less educated, poorer, and more likely to be HPV positive compared to controls. Approximately half of controls had allergies, over 60% of which included allergies to dust,

pollen, or mold. There was evidence for an inverse association between airborne allergens and OSCC (OR 0.67, 95% CI 0.48-0.93); there was no evidence for an association with other types of allergies. The airborne particle allergy association was limited to later stage OSCCs (regional or distant cancer at diagnosis) (OR 0.42, 95% CI 0.26-0.66) and was not observed in earlier stage cancers (in situ or local; OR 0.98, 95% CI 0.66-1.46).

The inverse association observed for later-stage but not earlier-stage OSCC supports the idea that persons with allergies are somehow also less likely to experience tumor progression, or promotion of early OSCC tumors (whereas an association with early-stage tumors might suggest that allergies are associated with improved ability to prevent tumor initiation).

Possible explanations for these findings include the “prophylaxis” theory, whereby the allergy symptoms themselves remove cancer-causing agents from the oral and pharyngeal cavities, or that the allergy symptoms cause people to modify their behaviors, thereby reducing their exposure to potential cancer-causing agents. As authors point out, large studies using biomarkers are necessary to further investigate any biological mechanisms underlying the observed associations.

[Stott-Miller M, Chen C, Doody DR, Carter JL, Galloway DA, Madeleine MM, Schwartz SM](#). 2012. A history of allergies is associated with reduced risk of oral squamous cell carcinoma. *Cancer Causes Control*. Epub ahead of print.



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