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- Pp. 1916-1918

JNCI Journal of the National Cancer Institute 1999 91(22):1916-1918; doi:10.1093/jnci/91.22.1916
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Journal of the National Cancer Institute, Vol. 91, No. 22, 1916-1918,
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NEWS

Wheezing, Sneezing, and Cancer Risk — Still an Open Door

Nancy Volkers

For many people, the immune system hums along as it should, protecting the body against viral pathogens and killing bacteria. But in others, the immune system can shift into overdrive, mounting a response beyond what is necessary against certain

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"invaders" — pollen, peanuts, a bee sting. The immune system can also sit idly by as a tumor grows and spreads.

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Epidemiologic studies on allergies and cancer provide some clues about why the body does not react to tumors the same way that some bodies react to pollen or to cat dander. But they also raise more questions.

Some research has found that people with allergies or allergy-related conditions, such as asthma or eczema, have a reduced risk of cancer. These studies imply that an immune system's hyperreaction to allergens might protect against tumors.

Studies in Shanghai, for example, showed up to a 60% decrease in the risk of cancer in people with allergies. A 1985 study using retrospective data from 13,655 cancer cases and 4,079 controls found a decreased risk of all types of cancer in patients with allergies.

Another study in the Netherlands found that patients who had been treated for allergies had a 40% decreased risk of developing pancreatic cancer. And this year, the German Cancer Research Center, Heidelberg, published the results of a case-control study that showed a statistically significant inverse association between glioma and asthma, glioma and eczema, and glioma and all allergic diseases combined.

Protecting Against NHL

At the University of California San Francisco, [Elizabeth Holly, Ph.D.](#), and colleagues have published a series of studies on the topic. In a 1997 paper on non-Hodgkin's lymphoma in HIV-positive and HIV-negative gay men, the group found that in HIV-positive men, allergies to grass, hay, leaves, plants, and pollen decreased non-Hodgkin's lymphoma risk by 65%. The number of bee or wasp stings also decreased non-Hodgkin's lymphoma risk. Among HIV-negative men, allergies decreased the risk of this cancer by more than 50%.



**Dr. Elizabeth
Holly**

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"When you control for HIV positivity, allergies and bee stings still turn out to be protective," said Holly, professor of epidemiology and biostatistics. "That's never been shown — no one has examined these factors. HIV positivity confers such an overwhelming increased risk for non-Hodgkin's lymphoma." In this study, HIV-positive gay men had more than a 20-fold risk of non-Hodgkin's lymphoma, compared with HIV-negative gay men.

In another study of non-Hodgkin's lymphoma, this one in women and heterosexual men, Holly and colleagues also found a decreased risk for this cancer associated with plant allergies or insect stings. "It may be that a history of allergies provides evidence for a persistent capacity for B-cell differentiation and therefore decreased accumulation of B cells," said Holly.

Not all evidence points to the protective effect of allergies, however. A 1992 study in Italy found that a history of allergic conditions did not affect the risk of non-Hodgkin's lymphoma. A cohort study of 34,198 Seventh-day Adventists in California, also published in 1992, had more complex results. Risks of prostate, breast, lymphatic, and hematopoietic cancers were actually elevated in persons who reported any type of allergic history. However, ovarian cancer risk was decreased in persons with any allergic history, and increasing numbers of allergies were associated with a corresponding decrease in ovarian cancer risk.

"Our hypothesis was that people who are reactive to chemicals like poison oak, bee stings, and such have a hyperreactive immune system," said W. Lawrence Beeson, assistant professor of epidemiology in the School of Public Health at Loma Linda University, and an author of the study. "As it relates to cancer surveillance, there may be a way the immune system is reacting abnormally to non-self, kind of the beginnings of cancer development."

A recent study from the National Cancer Institute found that ever having an allergic condition was associated with a 30% decreased risk of pancreatic cancer. [Debra Silverman, Sc.D.](#), a senior epidemiologist and first author on the study, said that "previous studies had reported a reduced risk associated with allergic conditions, so when we designed the study we asked a series of questions to see if there was a reduced risk, and if the risk was related to allergy treatment or type of allergy."[+](#)

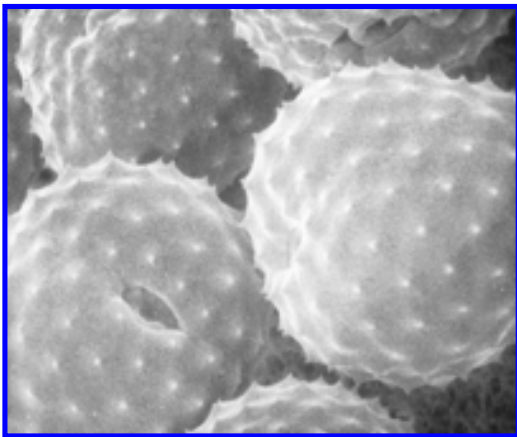


**Dr. Debra
Silverman**

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A recent study from the National Cancer Institute found that ever having an allergic condition was associated with a 30% decreased risk of pancreatic cancer. Several studies offer conflicting evidence of the link between allergic conditions and cancer. (Above: An electron micrograph of ragweed pollen, a common allergen.)

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Although pancreatic cancer has a very high mortality rate, Silverman and colleagues based their study on direct interviews with patients, rather than on interviews with next of kin, to maximize the accuracy of the information.

Details, Details

The 30% decreased risk suggested that "there might be something to this [theory]," said Silverman. "But when we looked at it by type of allergy, we saw reduced [cancer] risks for hay fever, animal allergies, insect bites and dusts and molds, but we didn't see a decreased risk for eczema, drug allergies, or asthma. When we looked at people who ever had allergy shots, there was no pattern. We saw a reduced risk for [asthmatics] who used bronchodilators alone, no reduced risk for those on bronchodilators and steroids,

and an increased risk for those on steroids alone."

The lack of a clear pattern to the results suggests, she said, "that this effect may have been due to chance. I can't be certain — it's epidemiology; we can never be certain! I wouldn't say it's a closed door either, but [the result] sure wasn't consistent."

A 1998 study from the National Institute for Environmental Health Sciences found no relationship between allergies or allergic conditions and the risk of acute myelogenous leukemia or acute lymphocytic leukemia. Glinda Cooper, Ph.D., an investigator in the Epidemiology Branch of NIEHS, said that "in the leukemia literature there's more with respect to viruses — childhood illnesses and leukemia risk — but there's really not much with allergies." The study did find an increased risk of both types of leukemia associated with childhood measles.

Several studies have found increased cancer risks associated with allergies. A 1988 study, using data from the first National Health and Nutrition Examination Survey, found that a history of allergy increased the risk of cancer by 40%. After categorization by type of allergy and type of cancer, the combination with the highest increase in risk was a history of hives coupled with lymphatic-hematopoietic cancers; people with this combination had a nearly eightfold increase in risk.

Where Next?

Despite the mixed results, Holly said that "most of the studies have shown a reduced risk for cancer among people who have a history of allergies. One perspective is that allergies are evidence of the competence of immune system function."

Holly and colleagues are planning another large non-Hodgkin's lymphoma study, and will pool some of the data with that from an NCI study already under way. "We will study genetic polymorphisms and use new gene array technology, in conjunction with colleagues at University of California, Berkeley, and Stanford University, to help clarify the biologic basis for some of the observed associations," she said.

Ultimately, said Holly, the "next wave" of studies in this area will bring a better understanding of what associations between allergies and cancer risk might mean for patients. Collaborations between epidemiologists, immunologists, and other scientists who investigate aspects of immune function and the genetics of disease, she concluded, "will provide significant advances in our understanding of the role allergies play in the risk for cancer."

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