The miseries of allergies just may help prevent some cancers, study finds

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(PhysOrg.com) -- There may be a silver -- and healthy -- lining to the miserable cloud of allergy symptoms: Sneezing, coughing, tearing and itching just may help prevent cancer -- particularly colon, skin, bladder, mouth, throat, uterus and cervix, lung and gastrointestinal tract cancer, according to a new Cornell study.

These cancers, interestingly, involve organs that "interface directly with the external environment," said Paul Sherman, Cornell professor of neurobiology and behavior, who led the study. He and colleagues analyzed 646 studies on allergies and cancers published over the past 50 years, putting together "the most comprehensive database yet available" on allergies and cancers.

The study revealed "a strong relationship" between allergies and cancer in environmentally exposed tissues, Sherman said. This relationship seldom exists, he noted, between allergies and cancers of tissues that are not directly exposed to the environment, such as cancers of the breast and prostate, as well as myelocytic leukemia and myeloma.

Moreover, the study found that allergies linked to tissues that are exposed to environmental factors -- eczema, hives, hay fever, and animal and food allergies -- were most strongly associated with lower rates of cancers in exposed tissues.

The study, co-authored with Erica Holland '05 (now a medical student at the University of Massachusetts) and Janet Shellman Sherman, a Cornell

research scientist and lecturer in neurobiology and behavior, is published in the December issue of The Quarterly Review of Biology (83:4).

"One of our main results was that more than twice as many studies reported inverse allergy-cancer associations as reported positive associations," said Sherman.

Sherman believes that allergy symptoms may help protect against cancer by shedding foreign particles from the body. Some of those particles, he said, might be carcinogenic or carry carcinogens.

"The idea is that the immunoglobulin E system (which is widespread among mammals) and its associated allergy symptoms serve a common prophylactic function," Sherman said, "namely engulfing in mucous and rapidly expelling pathogens, natural venoms and toxins and other potentially carcinogen-carrying antigens before they can trigger neoplasia [the abnormal proliferation of cells]."

Two cancers did not ostensibly fit with the pattern of allergies and lower rates of cancer in environmentally exposed tissues, Sherman noted. However, on closer examination, these "outliers were illuminating." Studies show that allergies are correlated with lower incidences of glioma and pancreatic cancer, which affect internal tissues. However, both glia (which participate in signal transmission in the nervous system, and whose stem cells are exposed to chemicals from the nasal epithelium via the olfactory tract), and pancreatic cells (which can be exposed to intestinal contents if the intervening sphincter malfunctions) "can sometimes come into direct contact with carcinogens from the external environment," Sherman said.

Asthma is linked to higher rates of lung cancer. Unlike other allergies, however, asthma reduces the ability to expel mucus, while other allergies facilitate mucous expulsion and are correlated with lower rates of lung

cancer.

The hypothesis that allergies may protect against certain types of cancer because they promote the expulsion of toxins and carcinogen-carrying antigens is also consistent with studies that find that people who express allergy symptoms are less likely to have toxic chemicals in their bodies, Sherman said.

So should people routinely suppress all allergy symptoms with medications? Sherman said the jury is still out. However, allergies are not merely disorders of the immune system, but rather are the evolved front line of defense against certain parasites and cancers. In sum, allergic reactions may be like fevers and morning sickness: uncomfortable responses that survived natural selection because they provided direct benefits.

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