

Newly Recognized Risk Factors May Help Explain Increase in Asthma

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DENVER — An approximate doubling of the incidence in asthma since the 1980s may be attributable in part to three newly recognized risk factors for the disease, according to [Harold Nelson](#), MD, Professor of Medicine at National Jewish Health. Dr. Nelson outlined evidence during a speech Friday, February 6, 2009, at the 31st Annual National Jewish Health Pulmonary and Allergy Update that lower levels of vitamin D, exposure to aerosol cleaning compounds, and a wider use of acetaminophen in place of aspirin, have contributed to the asthma epidemic.

"The hygiene hypothesis remains a convincing theory for the 50-fold difference in asthma rates between rural Africa and developed Western countries," said Dr. Nelson, referring to the theory that reduced exposure to bacterial and viral components have led to a dysregulation of the immune system and increased allergic diseases. "However, I don't think it fully explains the rise of asthma prevalence among all age groups during the past three decades in industrialized countries. These newly recognized risk factors are biologically plausible and better fit the epidemiological evidence."

Household cleaning products are known to contain chemicals that can irritate the airways. Beginning about 30 years ago, more and more cleaning compounds were available in an aerosolized form that could be inhaled. In one study of 4,500 women those employed in domestic cleaning were 46 percent to 109 percent more likely to develop asthma than were women not employed in domestic cleaning. Another study of 3,500 European women cleaning their own homes showed that those using spray cleaners at least 4 days a week were more than twice as likely to have physician-diagnosed asthma than those who used the cleaners less often or not at all.

The use of aspirin among children began declining sharply in 1980 after the US government began issuing warnings about the risk aspirin posed for Reye's syndrome among young children.

Two large studies have suggested a protective effect of aspirin against asthma. In the Physicians' Health Study, 22,040 physicians were randomly assigned to take aspirin or a placebo every other day. After an average of five years, 113 physicians taking the aspirin had developed adult-onset asthma, while 145 taking the placebo had developed the disease. In a similar protocol among 37,270 healthcare professional women, participants taking the placebo were about 10 percent more likely to develop asthma.

On the other hand, acetaminophen use may increase the chances of developing asthma. Acetaminophen decreases levels of the antioxidant glutathione in the lungs, which can help protect against damage caused by oxidants. In a study of 205,487 children aged 6-7 years of age, use of acetaminophen in the first year of life was associated with a 46 percent increase in prevalence of asthma symptoms, and more than three times the risk of asthma among children currently using medium to high doses of acetaminophen.

There has been increasing recognition that vitamin D can play a role in a well functioning immune system. However, there is evidence that a more sedentary, indoor lifestyle among urban poor, the obese and those dwelling in Western countries has led to a decrease synthesis of vitamin D, which comes from exposure to the sun. Increased awareness of skin cancer and use of sunscreen may also contribute to reduce vitamin D synthesis.

Laboratory studies have shown that vitamin D deficiency can lead to reduced control of T cells in the immune system and raise the potential for an overactive immune response as occurs in allergies and asthma. Low levels of vitamin D have also been associated with increased respiratory tract infections, a recognized risk factor for asthma.

"These are interesting, provocative findings that have accumulated over the past few years," said Dr. Nelson. "They need to be pursued so that we can decide if lifestyle changes should be recommended that could protect against the

development of asthma."

National Jewish Health is the leading respiratory hospital in the nation. Founded 124 years ago as a nonprofit hospital, National Jewish Health today is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune and related disorders. Patients and families come to National Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. To learn more, visit the [media resources page](#).

Media Contacts

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