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NEWS

RSNA Press Release

HRCT Reveals Asthmatic Risk Long After Cat Allergen Exposure

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At A Glance

- HRCT imaging reveals prolonged effects of exposure to cat allergen, long after outward symptoms have abated.
- Lung function remains impaired up to 22 hours after initial allergen exposure, leading to risk of severe subsequent asthma attacks.
- Most asthma inhaler sprays do not reach the small airways of the lungs.

CHICAGO - For the first time, researchers have shown that cat allergens can impair lung function in people with asthma for up to 22 hours after exposure. The study was presented today at the annual meeting of the Radiological Society of North America (RSNA).

"We studied cat allergen because it's an extra-fine particle that is both airborne and capable of penetrating deep into the small airways of the lungs," said lead author Jared W. Allen, Ph.D., researcher at David Geffen School of Medicine at the University of California, Los Angeles.

Exposure to cat allergen is very common and can contribute significantly to morbidity in the 15 million Americans with asthma. In many cases, the lung changes triggered by allergen exposure do not produce symptoms but contribute to persistent inflammation in the small airways that, if untreated, could lead to subsequent severe asthma attacks.

The prolonged inflammatory lung reaction is both clinically silent and poorly detectable with conventional pulmonary function tests. However, Dr. Allen and colleagues have developed a new high-resolution computed tomography (HRCT) technique that examines the function of small airways deep in the lungs to reveal the extent of impairment.

For the study, Dr. Allen's team used baseline pulmonary function tests and HRCT to measure lung function in 10 people with known allergy to cats. After being exposed to cat allergens, the patients were studied for three days. The results showed all 10 patients exhibited significant and prolonged decrease in lung function, even after outward symptoms had abated.

"Twenty-two hours after exposure, patients appeared to have otherwise recovered from respiratory symptoms according to clinical measures," Dr. Allen said. "However, HRCT still showed significant air trapping, suggesting that constriction and inflammation of the small airways remain long after initial exposure."

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Dr. Allen recommends that physicians be made aware of the importance of small airways in asthma, as it is difficult to reach these regions of the lung with conventional inhalers. He underscores the importance of developing inhaler devices and oral anti-inflammatory drugs that are capable of generating extra-fine particles to reach the small airways and suppress inflammation deep in the lung.

"A better understanding of the causes and complications of asthma, as afforded by this type of imaging, will lead to improved and targeted therapies for this disease," Dr. Allen said. "In addition, the quantitative image analysis used in this study may be one of the safest ways to evaluate the efficacy of these new drugs and aerosols in the treatment of asthma."

These findings are especially timely in the face of reports that childhood rates of allergy and asthma are on the rise. According to the recent National Survey of Lead and Allergens in Housing (NSLAH), even though fewer than half of American homes contain dogs and cats, 100 percent and 99.9 percent of homes contain dog and cat allergens, respectively.

Additional studies have shown that even low-level exposures to pet allergens, such as those found in schools and in homes without pets, can induce asthma symptoms. Detectable levels of pet allergens have also been established in office buildings, trains, buses, hospitals, shopping malls, movie theaters, hotels, restaurants and even the offices of allergists.

Co-authors are Jonathan G. Goldin, M.D., Ph.D., Hyun J. Kim, M.S., James Sayre, Ph.D., Michelle R. Zeidler, M.D., Dao A. Truong, B.S., Eric C. Kleerup, M.D., Nola Kennedy, Ph.D. and Donald P. Tashkin, M.D.

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