Team finds new type of severe asthma, can be treated with drugs that suppress the immune system

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(Medical Xpress) -- Researchers at the University of Pittsburgh School of Medicine have identified a subset of severe asthma that improves with drug regimens that suppress the immune system. In the American Journal of Respiratory and Critical Care Medicine, they dubbed the condition “asthmatic granulomatosis” after the characteristic small areas of focal inflammation that can be found in the lungs of those who have it.

Five to 10 percent of patients with asthma have disease that can be classified as severe, meaning it is difficult to treat and often causes life-threatening breathing problems, said lead author Sally E. Wenzel, M.D., professor, Division of Pulmonary, Allergy and Critical Care Medicine, Pitt School of Medicine, and director of the University of Pittsburgh Asthma Institute at UPMC and the University of Pittsburgh School of Medicine. Typically these patients are treated with the aim of reducing lung inflammation, but treatment often leads to devastating consequences due to steroid side effects.

“We’re now learning that all severe asthma is not the same, but is in fact the result of different problems,” she said. “If we better understand the underlying mechanisms that are causing the symptoms, we can offer better treatments.”

For the study, the team examined a group of patients with severe asthma who were being treated at the Difficult Asthma Clinic at the UPMC

Comprehensive Lung Center during a four-year period. Each of the patients met with a certified asthma educator; were taking high doses of inhaled steroids, with or without ingested steroids; and had been monitored for three to 24 months to optimize therapy.

Nineteen patients then underwent biopsies of their lung tissue using a video-assisted, fiberoptic scope. Ten of them not only had airway changes typical of asthma, but also lesions called granulomas, which are nodules of inflammation sometimes seen with certain infections or with autoimmune diseases. None of the patients had a history of hypersensitivity pneumonitis, an acute illness caused by inhalation of foreign particles such as dust, molds and fungi, which can also lead to granuloma formation.

However, 70 percent of the patients had a personal or family history of autoimmune-like disease such as lupus and rheumatoid arthritis. Because granulomas can be produced by an over-active immune system, the team treated the 10 cases with drugs that suppress it, including azathioprine, mycophenolic acid, methotrexate or infliximab. Nine of them reduced their steroid doses and had improvements in standard lung-function tests while one has experienced difficulty tolerating the powerful immune-suppressants.

Of the other nine patients who had biopsies, six had tissue changes that reflected asthma, but no granulomas, and three had other issues, including indications of aspiration, pneumonia and small blood clots.

“The unexpected finding of granulomas in a subset of patients with severe asthma warrants approaching it as a newly described disease, which we’ve named asthmatic granulomatosis,” Dr. Wenzel said. “It is a condition that has overlapping features of asthma, autoimmunity and granulomas, and it appears to respond better to immune-suppressants than to high-dose steroid treatment.”

Asthma specialists should consider getting tissue biopsies in atypical severe asthmatics, the researchers said. More research is needed to determine the immunological pathways that contribute to the disease and develop biomarkers that will simplify diagnosis of asthmatic granulomatosis, they added.

“These studies advance our division’s focus on precision, or personalized, medicine -- an effort to better refine specific patient diagnoses and tailor more effective therapies,” said Dr. Mark T. Gladwin, chief of the Pulmonary, Allergy and Critical Care Medicine Division.

Provided by University of Pittsburgh Medical Center