

Scientists identify how gastric reflux may trigger asthma

July 21 2008

Researchers at Duke University Medical Center appear to have solved at least a piece of a puzzle that has mystified physicians for years: why so many patients with asthma also suffer from GERD, or gastroesophageal reflux disease.

Clinicians first noted a relationship between the two diseases in the mid-1970s. Since then, studies have shown that anywhere from 50 to 90 percent of patients with asthma experience some aspect of GERD. But can GERD cause asthma, or, is it the other way around? Perhaps there is some shared mechanism at the root of both disorders causing them to arise together. Physicians could make a case for each scenario, but until now, the exact nature of the relationship was not clear.

Working in laboratory experiments with mice, Dr. Shu Lin, an assistant professor of surgery and immunology at Duke, discovered that inhaling tiny amounts of stomach fluid that back up into the esophagus – a hallmark of GERD – produces changes in the immune system that can drive the development of asthma.

In the experiments, researchers inserted miniscule amounts of gastric fluid into the lungs of mice (mimicking the human process of micro-aspiration, or breathing in tiny amounts) over a period of eight weeks. They compared these animals' immune systems with those of mice that were exposed to allergens but not the gastric fluid.

The immune systems of the two sets of mice responded very differently.

Those that had the gastric fluid in their lungs developed what researchers call a T-helper type 2 response, a type of immune system reaction characteristic of asthma. The other mice responded in a more balanced manner, mounting an immune reaction consisting of both T-helper type 1 and T-helper type 2 responses.

"This is the first experimental evidence in a controlled, laboratory setting linking these two very common conditions in humans," says Lin, the senior author of the study published online in the *European Journal of Clinical Investigation*. "These data suggest that chronic micro-aspiration of gastric fluid can drive the immune system toward an asthmatic response."

"This does not mean that everyone with GERD is going to develop asthma, by any means," says William Parker, an assistant professor of surgery at Duke and a co-author of the study. "But it may mean that people with GERD may be more likely to develop asthma. If there is an upside to this, it is that developing GERD is something we can pretty much treat and control."

Parker says poor diet, a lack of exercise and obesity all contribute to the development of GERD, and that rising rates of reflux disease are part of a "perfect storm" of environmental and behavioral factors driving escalating rates of asthma, particularly in Western cultures. "People should avoid the risk factors for GERD. We strongly believe that the rise in asthma, particularly among adults in the country, is in large measure due to lifestyle choices that can be changed."

Lin and Parker agree that much more work needs to be done to fully understand the cellular and molecular mechanisms involved in the relationship between reflux disease and asthma, but both feel their study offers new directions for developing additional treatment options for both problems.

Lin says patients who already have GERD can minimize gastric reflux – and thereby lessen their chances of developing asthma – by following a few simple guidelines: Eat smaller meals and eat several hours before going to bed; raise the head of the bed a few inches; maintain a healthy weight; and limit fatty goods, coffee, tea, caffeine and alcohol – they can relax the esophageal sphincter and make reflux more likely.

Source: Duke University

Citation: Scientists identify how gastric reflux may trigger asthma (2008, July 21) retrieved 17 April 2024 from <https://medicalxpress.com/news/2008-07-scientists-gastric-reflux-trigger-asthma.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.