Science Video

Thunderstorms And Asthma

Meteorologists And Epidemiologists Study Connection Between Thunderstorms And Asthma Attacks

September 1, 2008 — A multidisciplinary team studying weather patterns and records of emergency room visits found a rise in patients with asthma attacks in the days after a thunderstorm. They believe that rain breaks apart pollen grains, releasing allergens, while high winds scatter those particles and other irritants.

Twenty million Americans suffer from asthma, a disease that can be uncomfortable -- even life threatening -- and can interfere with the simplest of life's routines. For patients with asthma, staying attack-free often depends on knowing what triggers their attacks. Now, research shows something as simple as the weather may be a bigger factor than we ever imagined.

For Leslie Tripp, the first signs of an asthma attack are all too familiar.

"I just feel a tightening in my chest, and I can tell that something's coming on," says Tripp. "Probably the biggest trigger for an asthma attack for me is humidity." All kinds of things can trigger an asthma attack. Pets, cleaning solutions, irritants like pollution and pollen in the air, and even perfume are some of those things. Now, you can add something else.

A new study links thunderstorms and asthma attacks. Meteorologist J. Marshall Shepherd, Ph.D., says rain and wind break up irritants in the air and spread them around. "The rainfall actually can break the pollens into smaller aero-allergens -- the pollen grains -- and this can actually exacerbate upper respiratory problems," says Dr. Shepherd, of the University of Georgia. "Secondly, the windy gusts from thunderstorms actually serve to disperse these aero-allergens in a larger area around the thunderstorms themselves."

Climatologists and epidemiologists from the University of Georgia and Emory University analyzed 12 years of emergency room data from 41 hospitals in 20 Georgia counties. Immediately after thunderstorms, E.R. asthma visits tracked significantly higher.

"Certainly, any location that sees thunderstorms regularly throughout the year would likely be susceptible to this phenomenon," Dr. Shepherd says.

For asthma sufferers like Tripp, it could be food for thought. The more she knows about potential asthma triggers, the better shot she has at preventing the next attack.

Researchers say with global climate changes, conditions favorable for thunderstorms could increase in the years ahead -- and with it, the risk to people with asthma. They plan to expand their studies using Doppler radar and other more extensive storm data to study the asthma link in the future.

HOW STORMS DEVELOP: Storm clouds form as moisture evaporates from the earth into the atmosphere, where the droplets jostle against each other. The air cools off rapidly with as it reaches higher altitude. Sometimes a cold front -- the boundary between where the cold air from one thunderstorm meets the air outside the storm for example -- will force the moist air upward into the colder air. This moist air cools off and

the water vapor "condenses" into liquid drops, forming clouds. The process continues: more and more water vapor turns into liquid, and the moist air warms up even more and rises higher and higher. A thunderstorm results.

ASTHMA OR ALLERGIES? Asthma is a chronic disease affecting the airways that carry air in and out of the lungs. The inside walls of the airways become inflamed (swollen) and narrower so less air can flow through the lung tissues. This in turn causes wheezing, coughing, tightness in the chest, and trouble breathing. Asthma is linked to allergies, although not everyone with asthma has allergies. People with allergies tend to react more strongly to the presence of allergens such as animal dander, dust mites, pollen or mold, as well as cigarette smoke and air pollution.

The American Meteorological Society contributed to the information contained in the TV portion of this report.