Dirty Air Pollutes the Heart, Too

By Ed Edelson
HealthScoutNews Reporter

MONDAY, July 29, 2002 (HealthScoutNews) -- Pollution isn't just hard on the lungs -- it's bad for the heart, too.

A new study that confirms what many would deem to be common sense says that fine pollution particles squeeze off the oxygen supply to heart patients when they exercise.

"It's really been the last couple of years that data have accumulated showing a relationship between air pollution and heart disease -- increased incidence of heart attacks and admissions to hospitals during periods of high air pollution," says Dr. Murray A. Mittleman. "But we don't understand the mechanisms by which this happens. This study addresses that issue."

Finnish researchers put 45 patients with heart disease on exercise bicycles and had them pedal for six minutes, sometimes when the outdoor air was clear, sometimes when it was polluted, as the researchers recorded their electrocardiograms and looked for effects on the heart and blood supply.

What they found, says a paper in tomorrow's issue of Circulation: Journal of the American Heart Association, was that many of the volunteers were much more likely to experience ischemia, a reduced supply of oxygen to the heart muscle, after exposure to polluted air. They also were more likely to have an abnormal ECG pattern called an ST segment depression, which is linked to ischemia.

And the research indicates that these cardiac problems are related to specific air pollutants -- the fine particles that come primarily from factory smokestacks and the ultra-fine particles that come from diesel exhausts, among other sources.

The Finnish study thus "highlights myocardial ischemia as a significant potential mechanism responsible for adverse cardiac outcomes associated with poor air quality," says an editorial accompanying the Finnish report co-authored by Mittleman, who is director of cardiovascular epidemiology at Beth Israel Deaconess Medical Center in Boston.

The study won't change the advice he gives to patients, Mittleman says. "I've been telling my patients who are at high risk to avoid excessive exposure to outdoor air on days of high pollution, to try to avoid exercise and to spend more time in an air-conditioned environment," he says.

But the finding could have implications about measures to reduce the health problems associated with air pollution, "because the sources of the fine and ultra-fine particles are different from those of larger particles," Mittleman says. And it does indicate locations that people with heart trouble should avoid, he adds. Fine and ultra-fine particles do not have a long life in the atmosphere; they tend to clump together to form larger particles. So it is wise to avoid the emission sources of those small particles, such as bus depots, he says.

Dr. Len Horovitz, a pulmonary physician at Lenox Hill Hospital in New York City, says the Finnish study, done at the Unit Environmental Epidemiology of that country's National Public Health Institute, produced a logical result.

"It is the reduction of the oxygen level in the air that is causing ischemia," he says. "Evidently, an area that is polluted has the same kind of reduced oxygen level as seen in high-altitude areas."

Horovitz says the results are important for people with lung disorders as well as those with heart disease. "We all need a certain level of oxygen" he says. "People who need more oxygen are at risk when air pollution is high."

Running the air conditioner is one way to remove particulate pollutants from a room, Horovitz says. He also recommends use of portable air filter units, which do the same removal job without cooling the air.

Research to determine what different kinds and levels of air pollution cause health problems is going on at the Environmental Protection Agency and other centers, Horovitz says. The results of those studies will have "broad implications for the kind of legislation that is passed," he adds.

Meanwhile, Mittleman says, people who don't have heart or lung problems "can do the common-sense thing. If they have the choice to avoid excessive exposure on very polluted days, they should do so."

What To Do

You can learn about air pollution and the heart from the American Heart Association or the Environmental Protection Agency.

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