

Even a few days of air pollution may trigger heart attack, stroke

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Short-term exposure to air pollution -- just a day or a week in some cases -- may kick off a heart attack or stroke, scientists now say.

Two new studies reveal that the risk of heart attack or stroke can jump after high-pollution days, especially for people who already have predisposing health problems.

Up to a week of exposure to most major types of air pollution may be enough to trigger a heart attack, a new analysis published in the latest issue of the Journal of the American Medical Association finds. Heart attack risk went up by almost 5 percent with high carbon monoxide levels and almost 3 percent with higher levels of air particles for up to seven days.

The risk of stroke jumped 34 percent after 24 hours of exposure to moderate air pollution, according to a study published in the latest issue of the Archives of Internal Medicine.

The increase in stroke risk was greatest within 12 to 14 hours of exposure to fine particulate matter and was most strongly associated with pollution from traffic.

No one knows exactly how much pollution will trigger a heart attack or brain attack, but experts suggest that vulnerable people protect themselves by minimizing time spent breathing air contaminated with a heavy dose of fine particles.

“What we can say is that exposure to a high level of pollution is harmful to people at risk,” said Dr. Hazrije Mustafic, the lead author of the analysis that examined data for pollution and heart attack risk in 34 previous studies.

“They must avoid the most polluted places, like highways, for example,” said Mustafic, a cardiologist and a researcher in cardiovascular epidemiology at the University of Paris Descartes, INSERM Unit 970. “We do not know how long of an exposure causes an excess risk of heart attack, but the relationship is linear.”

In other words, Mustafic said, as exposure increases, both in terms of time and intensity, so does the risk of a heart attack.

The best recourse for those with cardiovascular disease may be to keep a close eye on local pollution levels, experts say. And government agencies are making that easier and easier. The Environmental Protection Agency, for example, has a downloadable app that provides information on local air quality.

While short-term exposures to pollution can't explain every stroke or heart attack, they do have a significant impact, experts said.

In 2007, for instance, there were 184,000 hospitalizations for stroke in the Northeastern U.S., said Gregory Wellenius, lead author of a paper on stroke risk published in the latest issue of the Archives of Internal Medicine.

"We estimate that 6,000 of those stroke hospitalizations could have been prevented," Wellenius said.

His research study is the first to look at how short-term exposure to pollution impacts stroke risk. And, even though he found an increased risk, Wellenius is hesitant to offer advice until other studies duplicate his findings.

"This is just one study," said Wellenius, who performed the research at Harvard's Beth Israel Deaconess Medical Center and is now an assistant professor of epidemiology at Brown University. "It was done in Boston, a city notable because it has relatively low pollution levels. The study should be replicated in other parts of the country."

The researchers did find that even moderate amounts of pollution can cause harm, said Roger Peng, an associate professor of biostatistics at the Johns Hopkins School of Public Health.

"They found a pretty sizable effect on ischemic stroke for a range of people at a relatively low level – one that is well under the national air quality standards," Peng said.

The study is underscoring the point that "there is no safe level," of pollution Peng added.

The culprit in both studies is particulate matter, tiny bits of material and droplets, known as PM2.5s. The particles come from a variety of sources, including power plants, factories, trucks and cars.

“These are very small particles, about a 30th of the diameter of a human hair,” Peng explained.

Peng suggested that people concerned about air quality download from the [AIRNow app](#) from the [EPA’s website](#). The app works on both Apple and Android phones and allows users to get pollutant and ozone levels for more than 400 cities across the nation.

On bad air days, people at risk for heart attack or stroke might want to be careful about exercising outside, Peng said.

Other researchers go even further.

“If you have any kind of cardiovascular risk factor it might be prudent to avoid anything that could make you breath hard and bring more junk into your lungs,” said Patrick Kinney, a professor of environmental health sciences at the Mailman School of Public Health at Columbia University. “The trouble with some of these pollutants is that they can get inside, too.”

The two new studies extend what scientists had already learned about pollution and cardiovascular disease, Kinney said. Earlier research showed that long-term exposure to pollutants could lead to clogged arteries, just as smoking cigarettes can, Kinney said.

While people can try to limit their personal exposure to these tiny particles, the best approach would be to get pollution levels down, Kinney said.

“To me this suggests the need to push for cleaner air,” he added. “If all cars and trucks were electric powered you wouldn’t have to worry as much.”

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