NEW YORK - Increases in particles polluting the air are associated with an increase in the number of strokes caused by a blood clot in the brain -- but not the type caused by an artery rupture in the brain -- new research shows.

Previous reports have shown a link between air pollution and overall risk of heart attacks and other cardiovascular events, but the specific effect on stroke risk has not been well studied, lead author Dr. Gregory A. Wellenius, from Beth Israel Deaconess Medical Center in Boston, told Reuters Health.

"Our study is the first large study in the US to address this topic," he said.

The researchers evaluated the link between air pollution and stroke among Medicare recipients in nine US cities. Specifically, they analyzed data on 155,503 artery-blockage (ischemic) strokes and 19,314 bleeding (hemorrhagic) strokes recorded as hospital admissions between 1986 and 1999.

As reported in the American Heart Association's journal Stroke, the team found that an increase in particulate air pollution from the lowest to the highest levels raised ischemic stroke admissions by 1.03 percent on the same day. Further analysis yielded similar results for levels of carbon monoxide, nitrogen dioxide, and sulfur dioxide.

By contrast, the investigators found no association between air pollution and hospital admission for hemorrhagic stroke.

Wellenius cited three possible mechanisms, which alone or in combination might explain how air pollution promotes stroke. "One possibility is through inflammatory effects. The other is through pulmonary reflexes that trigger changes in blood pressure or heart rate." A third possibility is changes in clotting factors that tend to promote more blood clots.
Although the increase in ischemic stroke risk is small, the number of excess strokes can be high because pollution affects the whole population.

"Taken together with previous reports, the results suggest that reducing exposure to air pollution is likely to reduce the risk of a number of health problems, including heart disease and stroke," Wellenius concluded.


Story by Anthony J. Brown, MD

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