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Women with diabetes exposed to air pollution at higher risk for heart disease

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Women with diabetes who are exposed to air pollution for long periods may have a much higher risk for heart disease, according to a long-term, nationwide study published in the *Journal of the American Heart Association*.

"Although studies have shown that people with diabetes are particularly vulnerable to the cardiovascular effects of acute exposures to air pollution, our study is one of the first to demonstrate high risks of cardiovascular disease among individuals with diabetes with long-term exposures to particulate matter," said Jaime E. Hart, Sc.D., study lead author and assistant professor at Brigham and Women's Hospital and Harvard Medical School in Boston, Massachusetts.

Researchers studied 114,537 women (average age 64) who were part of the Nurses' Health Study. During the follow-up in 1989-2006, researchers recorded incidences of cardiovascular disease (6,767), coronary heart disease (3,878) and strokes (3,295).

Researchers calculated the impacts of three different sizes of particulate matter (PM) air pollution:

- Fine particulate pollutant smaller than 2.5 thousandths of a millimeter in diameter (PM2.5), which is much smaller than a speck of dust, 1/30th diameter of a human hair and not visible to the human eye, is created from combustion from cars, power plants, etc.

- Particulate pollutant larger than PM2.5 but smaller than PM10 (PM2.5-10) is created from windblown dust, crushing and grinding and road dust.
- Particulate pollutant PM10 includes both PM2.5 and PM2.5-10.

While all women had small increased risks of cardiovascular disease (CVD) with more air pollution exposure, the risk of cardiovascular disease and stroke among women with diabetes for each 10 micrograms per cubic meter of air, the increase was:

- 44 percent for CVD (66 percent for stroke) for smallest size pollution;
- 17 percent for CVD (18 percent for stroke) for road dust-type larger size pollution; and
- 19 percent for CVD (23 percent for stroke) for exposure to both sizes of pollution.

Researchers also found higher effects of air pollution among women 70 and older, obese women and women who lived in the northeast or south.

"It is important to identify these subgroups, so that pollution standards can be developed that protect them," Hart said.

Smoking status and family history didn't consistently modify the association between particulate matter and cardiovascular disease, and risks were most elevated with exposures in the previous 12 months, researchers said.

The study was limited in that the participants were mostly white women of middle- and upper-socioeconomic status.

Provided by American Heart Association