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# For women with diabetes, air pollution has higher heart risks

BY KATHRYN DOYLE

(Reuters Health) - Particle pollution like soot is a known health hazard and linked to the risk of heart disease and stroke, but women with diabetes are even more vulnerable than most people, according to a new U.S. study.

"There is a convincing literature that long-term air pollution is associated with a higher risk of cardiovascular disease," said lead author Jaime E. Hart of Brigham and Women's Hospital and Harvard Medical School in Boston, adding, "a number of studies of short-term air pollution exposures have suggested that individuals with diabetes are at higher risk of cardiovascular disease."

The researchers studied 114,537 women in the decades-long Nurses' Health Study for whom there was data on pollution exposure and health outcomes. Between 1989 and 2006 there were 6,767 cases of cardiovascular disease, 3,878 cases of coronary heart disease and 3,295 strokes in the group.

Cardiovascular disease risk rose slightly for all women with increasing exposure to the kind of tiny pollution particles that come from engine combustion, power plants and road dust.

For the women with diabetes, however, the risk increases were greater – for every additional 10 micrograms of pollution particle exposure, there was a 19 percent increase in the odds of cardiovascular disease and 23 percent increase in the odds of having a stroke.

The finest particles, known as PM 2.5, which typically come from vehicle exhaust and power plants and can enter the bloodstream after being inhaled raised risk the most. Exposure to an additional 10 micrograms of PM 2.5 pollution led to a 44 percent increase in heart disease and 66 percent increase in stroke risk, according to the results in the Journal of the American Heart Association.

The U.S. Environmental Protection Agency safe exposure limit for PM 2.5 particles outdoors is an average of 12 micrograms, or 12 millionths of a gram, per cubic meter of air over a 24-hour period. The World Health Organization puts the limit at 20 micrograms.

Pollution was also particularly harmful for women age 70 and older, those who were obese and those living in the Northeast or South. Risks were highest in relation to pollution exposure within the previous 12 months.

"There is some evidence to suggest that when women with diabetes are exposed to air pollution that they have higher levels of air pollution and oxidative stress than women without diabetes, but I think this is an area where more research is needed," Hart told Reuters Health by email.

"Most of the evidence suggests that the results would be similar in men, but interactions with hormones can't be ruled out," he said.

Diabetes is an inflammatory disease, and air particles may cause further inflammation, putting more stress on the cardiovascular system, said Dr. Bart Ostro of the Air Pollution Epidemiology Section of the California Office of Environmental Health Hazard Assessment, who was not part of the new study.

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"I know diabetics already have a lot to think about and worry about," but taking the same steps they already take to manage their diabetes, like diet, exercise and medications, may reduce heart disease risk as well, Ostro told Reuters Health

"People downwind from power plants are definitely going to have a higher risk," he said. "I don't know if I would tell people to move immediately, but it's a risk to be taken into account."

Major roadways are also important pollution sources, he said.

"Given the vast literature on the adverse health effects of air pollution, I do believe that people should be concerned about air pollution exposures," Hart said. "I think the recommendations for women with diabetes would be similar to advice for all women: don't smoke cigarettes, eat a healthy diet, get regular exercise and, when practical, avoid being outside in areas of high pollution."

SOURCE: [bit.ly/1f4U4k9](http://bit.ly/1f4U4k9) Journal of the American Heart Association, online November 25, 2015.

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