Air pollution increases risk for hypertension in pregnant women

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(Medical Xpress)—Breathing the air outside their homes may be just as toxic to pregnant women—if not more so—as breathing in cigarette smoke, increasing a mom-to-be's risk of developing deadly complications such as preeclampsia, according to findings from a new University of Florida study.

UF researchers compared birth data with Environmental Protection Agency estimates of air pollution, finding that heavy exposure to four air pollutants led to a significantly increased risk for developing a high blood pressure disorder during pregnancy. The research was published in the January issue of the *Journal of Epidemiology & Community Health*.

The pollutants include two specific types of fine and coarse particulate matter, carbon monoxide and sulfur dioxide. According to the EPA, particulate matter includes acids, dust, metals and soil particles. These inhalable particles are released from industries and forest fires and can form when gases react with each other in the air. Sulfur dioxide is emitted from power plants and industries. Most carbon monoxide is produced by car exhaust.

"Fetal development is very sensitive to environmental factors," said Dr. Xiaohui Xu, an assistant professor of epidemiology in the colleges of Public Health and Health Professions and Medicine. "That is why we wanted to do this research. Hypertension (high blood pressure), in particular, is associated with increased morbidity and mortality, causing a lot of problems for the mother and fetus, including preterm delivery."

Hypertensive disorders such as gestational hypertension, preeclampsia and the deadly condition it leads to, eclampsia, affect about 10 percent of pregnancies. Despite the serious risks to mother and baby, little is known about what specifically causes these conditions to develop in pregnant women, the researchers say.

To gain a better understanding of how environmental factors may play a role in increasing the risk of developing hypertension during pregnancy, the researchers examined data from women who gave birth in Jacksonville, Fla., between 2004 and 2005 and environmental data from their communities. The sample included more than 22,000 pregnant women.

The researchers did not include mothers with chronic hypertension, those who had previously given birth prematurely or those whose babies were born with other complications in the sample. They then gauged how much pollution the women were exposed to throughout their pregnancies using data the EPA gathered daily to measure the levels of several pollutants.

Among the sample of women, 4.7 percent developed a hypertensive disorder during pregnancy. Exposure to air pollutants throughout the first two trimesters of pregnancy increased women's risk of developing one of these conditions, Xu said. They determined this after controlling for other factors that could affect a woman's risk for developing hypertension, such as socioeconomic status, exposure to co-pollutants and smoking during pregnancy. But they could not determine conclusively whether exposure early in the pregnancy or late in the pregnancy was more likely to increase a woman's risk for hypertension.

"It looks like the whole period has impacts for hypertension," he said.

On the basis of these findings, the researchers say more air pollution

control is necessary to prevent dangerous complications in pregnant women and babies. Although more studies are needed, the researchers hypothesize that exposure to air pollution during pregnancy may affect a woman's normal pattern of blood pressure.

Next, the researchers plan to expand their study throughout the state and also examine other conditions that could be affected by pollution.

"We are trying to look at several outcomes," Xu said. "We also want to look at preterm delivery and low birth-weight and find out what the effects of breathing contaminated air are on fetal development."

Provided by University of Florida