

Air pollutants linked to abnormal fetal growth

February 23 2018, by Ziba Kashef



Credit: Yale University

Chinese mothers who were exposed to a high level of certain air pollutants during pregnancy had a higher risk of abnormal fetal growth, according to a new Yale School of Public Health (YSPH) study.

The findings, published in the *International Journal of Epidemiology*,

were based on data collected from more than 8,000 women in Lanzhou, China from 2010 to 2012.

The researchers said that, to their knowledge, it is the first study of its kind to be conducted in areas with very high [air pollution levels](#).

"There is a lack of studies investigating the association between [air pollution](#) and fetal overgrowth," said Yawei Zhang, M.D., associate professor at YSPH. "We analyzed data from Lanzhou Birth Cohort Study to investigate the hypothesis that exposure to high levels of PM10 during pregnancy increases the risk of abnormal fetal growth, including both undergrowth and overgrowth, to determine if and how expectant mothers could protect themselves from possible contributing pollutants."

In collaboration with researchers from the Gansu Provincial Maternity and Child Care Hospital, the Yale scientists collected the daily average concentration for PM10—a diverse class of air pollution with health implications—from the government monitoring stations in Lanzhou. Using ultrasound measures of four fetal growth parameters during pregnancy, the researchers examined the associations between PM10 exposure and risk of abnormal fetal growth.

The researchers consistently identified positive associations between higher levels of exposure to a mixture of pollutants from car fumes, industry emissions, or construction activities and fetal head circumference overgrowth, they said.

Pregnant women's home and work addresses were collected through in-person interviews, and researchers calculated daily PM10 concentrations by incorporating each participant's home and work addresses.

Zhang says the novel finding that high levels of PM10 are associated with risk of overgrowth should be confirmed by other studies in

different populations, and that it is also important to identify the specific pollutants that are responsible for this association by investigating the components of PM10.

"Our results have important public health implications and call for future studies to explore the underlying mechanisms and postnatal consequences to the findings," says Zhang. "We are going to replicate the findings in another [birth cohort](#) and will continue to identify individuals who are more susceptible to air pollution."

Women in the region may lower the risk of fetal overgrowth by choosing their inception time and reducing their outdoor activities during the days with high [air pollution](#), said Zhang.

Pregnant women who came to the Gansu Provincial Maternity and Child Care Hospital for delivery in 2010-2012 and who were 18 years or older with gestation age of more than 20 weeks were eligible to participate in this study.

Provided by Yale University

Citation: Air pollutants linked to abnormal fetal growth (2018, February 23) retrieved 4 May 2024 from <https://medicalxpress.com/news/2018-02-air-pollutants-linked-abnormal-fetal.html>

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