

Study adds to understanding of how phthalate exposure impacts pregnancy

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Pregnancy test. Credit: public domain

In recent years, scientists have linked chemicals known as phthalates with complications of pregnancy and fetal development.

Now, a study led by researchers at the University of Michigan School of Public Health sheds light on the mechanism that may be to blame.

Phthalates are chemicals used to make plastic materials more flexible and can also be found in [personal care products](#) such as perfumes, deodorants and lotions. They can enter the human body by being ingested, inhaled or through the skin. Most often phthalates are

metabolized and excreted quickly, but constant contact with them means that nearly everyone in the United States is exposed, some more than others.

Kelly Ferguson, a postdoctoral research fellow, and John Meeker, associate professor of [environmental health sciences](#) and associate dean for research at the School of Public Health, along with their team, tested urine samples from pregnant women and found an association between the presence of [phthalates](#) and increased levels of biomarkers of [oxidative stress](#).

"It is not fully known what the impacts of increased oxidative stress on pregnancy might be, but this is an active area of research," Meeker said. "We recently showed in another analysis among the same cohort of women that biomarkers of oxidative stress were associated with increased risk of preterm birth. Other effects, such as adverse [fetal development](#) and maternal health complications, may also be related to oxidative stress."

Their findings, published online November 17 in *Environmental Health Perspectives*, are consistent with a smaller study in Puerto Rico the team reported earlier this year. The two studies are believed to be the first to associate phthalate exposure in humans with increased oxidative stress biomarkers in pregnancy.

Both studies are funded by the National Institute for Environmental Health Sciences, National Institutes of Health.

Oxidative stress occurs when there is an imbalance between free radicals (oxygen containing molecules with one or more unpaired or "dangling" electrons) and the antioxidants that defend against them. Such imbalances have been associated with a number of adverse health conditions.

In collaboration with Harvard Medical School's Brigham and Women's Hospital, the researchers examined urine from 482 women in the Boston area at up to four time points during pregnancy.

Nine phthalate metabolites were measured to determine exposure levels, and two markers found to be indicative of oxidative lipid and DNA damage, known as 8-hydroxydeoxyguanosine and 8-isoprostane, respectively, also were measured.

"We found that the links between these two sets of biomarkers were very strong when adjusting our analysis for other important factors." Meeker said. "We plan to conduct more in-depth studies to shed light on how exactly this may be occurring, and the full downstream consequences of these findings."

Provided by University of Michigan

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