

# Study links cadmium levels in women's urine to endometriosis

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Women with a history of endometriosis had higher concentrations of

cadmium in their urine compared to those without that diagnosis, according to a Michigan State University study that suggests the toxic metal could be linked to the development of endometriosis.

Affecting one in 10 reproductive-age women, endometriosis is a gynecologic condition in which tissue that looks like the lining of the uterus, or womb, appears outside the uterus. Those with endometriosis can experience chronic, painful and debilitating symptoms, which can interfere with all aspects of life, including daily activity, work productivity, school performance and personal relationships.

"Despite the adverse impact of endometriosis on quality of life, it remains an understudied condition," said Kristen Upson, assistant professor in the Department of Epidemiology and Biostatistics at the MSU College of Human Medicine and senior author of the study.

"By looking at [environmental risk factors](#) such as metal [cadmium](#), we are moving the needle closer to understanding risk factors for this condition," added the study's first author, Mandy Hall, a data analyst in the MSU Department of Epidemiology and Biostatistics.

Cadmium is a toxic metal and a "metalloestrogen," meaning it can act like the hormone estrogen. In the U.S., people are commonly exposed to cadmium by breathing in [cigarette smoke](#) and eating contaminated food like spinach and lettuce.

While this is not the first study exploring a potential link between cadmium and endometriosis, the researchers said it's the largest study to look at cadmium measured in urine, which reflects long-term exposure between 10 and 30 years.

For their study, researchers used data from the National Health and Nutrition Examination Survey, or NHANES, a national study

representative of the U.S. population between 1999 and 2006. Out of the survey's more than 41,000 participants, the researchers limited their study population to those 20 to 54 years of age with information on endometriosis diagnosis. The study has been published in the journal *Human Reproduction*.

The researchers then analyzed the data, dividing the cadmium levels into four classes, or quartiles, with the first quartile being the lowest exposure and the fourth being the largest exposure.

They found that participants in the second and third quartiles were twice as likely to have been diagnosed with endometriosis than those in the first quartile. The data also suggests a 60% increased prevalence of endometriosis based on urinary cadmium concentrations in the fourth quartile.

"The findings are interesting given that cadmium can act like the hormone estrogen, and this hormone is central to the development of endometriosis," Hall said.

The researchers say further studies are needed to confirm their findings. Upson said this work is part of her larger research looking at everyday factors that may increase toxic metal exposure in women as well as the impact of toxic metals on gynecologic health. Hall plans to incorporate [environmental factors](#) in their ongoing research on [endometriosis](#) and other gynecologic conditions.

**More information:** Mandy Hall et al, Urinary cadmium and endometriosis prevalence in a U.S. nationally-representative sample: Results from NHANES 1999-2006, *Human Reproduction* (2023). [DOI: 10.1093/humrep/dead117](https://doi.org/10.1093/humrep/dead117)

Provided by Michigan State University

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