

Heavy metals are toxic to ovaries, may lead to earlier menopause

January 25, 2024 [Kim North Shine](#)



Middle-aged women with elevated levels of heavy metals are more likely to have depleted ovarian function and egg reserves, which may lead to earlier arrival of menopause and its negative health effects, a new University of Michigan study shows.

Researchers reviewed data on hundreds of women approaching menopause and found that the presence of cadmium, mercury and arsenic in their urine was connected to low levels of anti-Müllerian hormone. AMH measures ovarian reserve, or the number of eggs available for fertilization or menstruation. Menopause is the time of life when hormone depletion ends monthly menstruation and sets off many changes to women's health and wellness.

The observed magnitude of associations between heavy metals and AMH was stronger than the association between smoking and AMH, which is a known risk factor for depleted ovarian reserve,

Study: [Heavy Metals and Trajectories of Anti-Müllerian Hormone During the Menopausal Transition](#)

according to the study published Jan. 25 in *The Journal of Clinical Endocrinology & Metabolism*.

“Widespread exposure to toxins in heavy metals may have a big impact on health problems linked to earlier aging of the ovaries in middle-aged women, such as hot flashes, bone weakening and osteoporosis, higher chances of heart disease, and cognitive decline,” said study author [Sung Kyun Park](#), associate professor of epidemiology and environmental health sciences at the U-M School of Public Health.

“Our study linked heavy metal exposure to lower levels of anti-Müllerian hormone in middle-aged women. AMH tells us roughly how many eggs are left in a woman’s ovaries. It’s like a biological clock for the ovaries that can hint at health risks in middle age and later in life.”



Sung Kyun Park

Using data from the longitudinal Study of Women’s Health Across the Nation, Park and colleagues reviewed 2,252 repeated measurements of AMH in 549 women within 10 years after their final menstrual period. The women in the study were ages 45 to 56 and were ethnically diverse: 45% white, 21% Black, 15% Chinese and 19% Japanese.

“Given that heavy metals are widespread in the general population and urinary metal concentrations measured in our study were comparable to the general female population across the United States, the potential adverse effects of heavy metals on ovarian function should be of significant public health concern,” Park said.

Arsenic, cadmium, mercury and lead are commonly found in drinking water, air pollution and some foods, notably seafood and rice. The metals are considered endocrine-disrupting chemicals that can cause infertility, cancers and other diseases.

Prior research offers toxicological evidence that heavy metals may negatively affect reproductive health. Only a few studies have explored associations of cadmium and lead with AMH, reporting that cadmium may alter AMH concentrations in pregnant women and premenopausal women ages 30 to 45. The new study focused on perimenopausal women.

This information may enable researchers to address adverse health outcomes known to be associated with metals and with reproductive hormone changes such as premature menopause, bone loss and osteoporosis, increased risks of cardiovascular disease, cognitive decline and vasomotor symptoms, according to the study authors.

“We see this significant public health concern, which may also have implications for women of all ages,” Park said.

The researchers say their findings require further investigation, particularly in a younger population, to fully understand the role of heavy metals as potential ovarian toxicants that diminish ovarian reserves.

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