

Earlier menopause linked to everyday chemical exposures

January 28 2015



High levels of chemicals found in plastics, personal-care products, common household items and the environment have been linked to an early decline in ovarian function, according to new research at Washington University School of Medicine in St. Louis. Credit: Eric Young, Washington University in St. LOuis

Women whose bodies have high levels of chemicals found in plastics, personal-care products, common household items and the environment experience menopause two to four years earlier than women with lower levels of these chemicals, according to a new study at Washington

University School of Medicine in St. Louis.

The findings are reported online Jan. 28 in the journal *PLOS ONE*.

The researchers looked at levels in blood and urine of 111 chemicals that are suspected of interfering with the natural production and distribution of hormones in the body. While several smaller studies have examined the link between so-called endocrine-disrupting chemicals and menopause, the new research is the first to broadly explore the association between menopause and individual chemicals on a large scale, using a nationally representative sample of patients across the United States.

"Chemicals linked to earlier menopause may lead to an early decline in ovarian function, and our results suggest we as a society should be concerned," said senior author Amber Cooper, MD, an assistant professor of obstetrics and gynecology.

A decline in ovarian function not only can adversely affect fertility but also can lead to earlier development of heart disease, osteoporosis and other health problems. Other problems already linked to the chemicals include certain cancers, metabolic syndrome and, in younger females, early puberty.

"Many of these chemical exposures are beyond our control because they are in the soil, water and air," Cooper said. "But we can educate ourselves about our day-to-day chemical exposures and become more aware of the plastics and other household products we use."

For example, Cooper recommends that people microwave food in glass or paper containers instead of in plastic and try to learn more about the ingredients in cosmetics, personal-care products and food packaging they use every day.

Although many of the chemicals included in the study have been banned from U.S. production because of their [negative health effects](#), they still are produced globally and are pervasive in the environment.

In the study, Cooper and researchers at the University of Missouri-Kansas City School of Medicine and the Wadsworth Center at the State University of New York at Albany analyzed data collected from 1999-2008 as part of the National Health and Nutrition Examination Survey, conducted by the U.S. Centers for Disease Control and Prevention.

The survey included data from 31,575 people, including 1,442 [menopausal women](#) who had been tested for levels of endocrine-disrupting chemicals. The average age of these women was 61, and none was using estrogen-replacement therapies or had had surgery to remove ovaries.

The survey was designed so that the women who had undergone chemical testing would represent a population of almost 9 million menopausal women.

The women's blood and urine samples were analyzed for exposures to 111 mostly man-made chemicals, which included known reproductive toxins and/or those that take more than a year to break down. Chemicals from the following categories were analyzed in the survey: dioxins/furans (industrial combustion byproducts); phthalates (found in plastics, common [household items](#), pharmaceuticals and personal-care products including lotions, perfumes, makeup, nail polish, liquid soap and hair spray); phytoestrogens (plant-derived estrogens); polychlorinated biphenyls (PCBs, coolants); phenolic derivatives (phenols, industrial pollutants); organophosphate pesticides; surfactants; and polycyclic aromatic hydrocarbons (combustion products).

The researchers identified 15 chemicals—nine PCBs, three pesticides, two phthalates and a furan (a toxic [chemical](#))—that warrant closer evaluation because they were significantly associated with earlier ages of menopause and potentially have detrimental effects on ovarian function.

"Earlier menopause can alter the quality of a woman's life and has profound implications for fertility, health and our society," Cooper said. "Understanding how the environment affects health is complex. This study doesn't prove causation, but the associations raise a red flag and support the need for future research."

More information: Grinder NM, Allsworth JE, Macones GA, Kurunthachalam K, Roehl KA, Cooper AR. Persistent organic pollutants and early menopause in U.S. women. *PLOS ONE*, Jan. 28, 2015. [journals.plos.org/plosone/arti ... journal.pone.0116057](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0116057)

Provided by Washington University School of Medicine

Citation: Earlier menopause linked to everyday chemical exposures (2015, January 28) retrieved 27 April 2024 from

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