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Endometriosis risk linked to two pesticides

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A Fred Hutchinson Cancer Research Center-led study has found that two organochlorine pesticides are associated with an increased risk of endometriosis, a condition that affects up to 10 percent of reproductive-age women.

Specifically, researchers observed that women with higher exposures to two such pesticides, beta-hexachlorocyclohexane and mirex, had a 30- to 70-percent increase in endometriosis risk.

The findings are published online ahead of the print issue of *Environmental Health Perspectives*, a journal of the National Institute of Environmental Health Sciences, part of the National Institutes of Health.

Endometriosis is a noncancerous condition that occurs when the tissue that lines the inside of the uterus, or womb, grows outside of the organ and attaches to other structures or organs. The condition most often affects the ovaries, fallopian tubes and lining of the pelvic cavity. The most common symptoms include chronic pelvic pain, painful menstrual periods and infertility.

"For many women, the symptoms of endometriosis can be chronic and debilitating, negatively affecting health-related quality of life, personal relationships and work productivity," said lead and corresponding author Kristen Upson, Ph.D., who was a predoctoral research fellow in epidemiology at Fred Hutch and the University of Washington when the study was conducted. Today she is a postdoctoral fellow at the Epidemiology Branch of the NIEHS.

"Since endometriosis is an estrogen-driven condition, we were interested in investigating the role of environmental chemicals that have estrogenic properties, such as organochlorine pesticides, on the risk of the disease," she said.

The principal investigator of the study was Victoria Holt, Ph.D., a joint member of the Epidemiology Research Unit in the Public Health Sciences Division at Fred Hutch and professor of epidemiology at the University of Washington School of Public Health.

"This research is important, as endometriosis is a serious condition that can adversely affect the quality of a woman's life, yet we still do not have a clear understanding of why endometriosis develops in some women but not in others," Holt said. "Our study provides another piece of the puzzle."

The study was conducted among members of Group Health Cooperative, a Seattle-based nonprofit health care system. The study involved 248 women newly diagnosed with endometriosis and, for comparison, 538 women without the disease.

"We found it interesting that despite organochlorine pesticides being restricted in use or banned in the U.S. for the past several decades, these chemicals were detectable in the blood samples of women in our study and were associated with increased endometriosis risk," Upson said. "The take-home message from our study is that persistent environmental chemicals, even those used in the past, may affect the health of the current generation of reproductive-age women with regard to a hormonally driven disease."

Organochlorine pesticides have generally demonstrated estrogenic properties in laboratory studies of human tissue and adverse reproductive effects in laboratory studies of other model organisms, altering the

function of the uterus and ovaries, as well as hormone production.

"Given these actions, it's plausible that organochlorine pesticides could increase the risk of an estrogen-driven disease such as endometriosis," Upson said. "We hope our findings will help inform current global policymaking to reduce or eliminate their use."

More information: "Organochlorine Pesticides and Risk of Endometriosis: Findings from a Population-Based Case-Control Study", *Environmental Health Perspectives*, 2013.

Provided by Fred Hutchinson Cancer Research Center