News Summary

<u>OR33-4:</u> Bisphenol A exposure in pregnant mice permanently changes DNA of offspring

Exposure during pregnancy to the chemical bisphenol A, or BPA, found in many common plastic household items, is known to cause a fertility defect in the mother's offspring in animal studies, and now researchers have found how the defect occurs. The results of the new study will be presented Saturday at The Endocrine Society's 91st Annual Meeting in Washington, D.C.

The study, funded partly by the National Institutes of Health, joins a growing body of animal research showing the toxic health effects of BPA, including reproductive and developmental problems. Last August the U.S. Food and Drug Administration found BPA to be safe as currently used but later said more research on its safety is needed. BPA is used to make hard polycarbonate plastic, such as for baby bottles, refillable water bottles and food containers, as well as to make the linings of metal food cans.

BPA has estrogen-like properties and in pregnant animals has been linked to female infertility.

"The big mystery is how does exposure to this estrogen-like substance during a brief period in pregnancy lead to a change in uterine function," said study co-author Hugh Taylor, MD, professor and chief of the reproductive endocrinology section at Yale University School of Medicine.

To find the answer to that question, Taylor and his co-workers at Yale injected pregnant mice with a low dose of BPA on pregnancy days 9 to 16. After the mice gave birth, the scientists analyzed the uterus of female offspring and extracted DNA.

They found that BPA exposure during pregnancy had a lasting effect on one of the genes that is responsible for uterine development and subsequent fertility in both mice and humans (HOXA10). Furthermore, these changes in the offspring's uterine DNA resulted in a permanent increase in estrogen sensitivity. The authors believe that this process causes the overexpression of the HOXA10 gene in adult mice that they found in previous studies.

The permanent DNA changes in the BPA-exposed offspring were not apparent in the offspring of mice that did not receive BPA injection (the controls). This finding demonstrates that the fetus is sensitive to BPA in mice and likely also in humans, Taylor said.

"We don't know what a safe level of BPA is, so pregnant women should avoid BPA exposure," Taylor said. "There is nothing to lose by avoiding items made with BPA—and maybe a lot to gain."

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