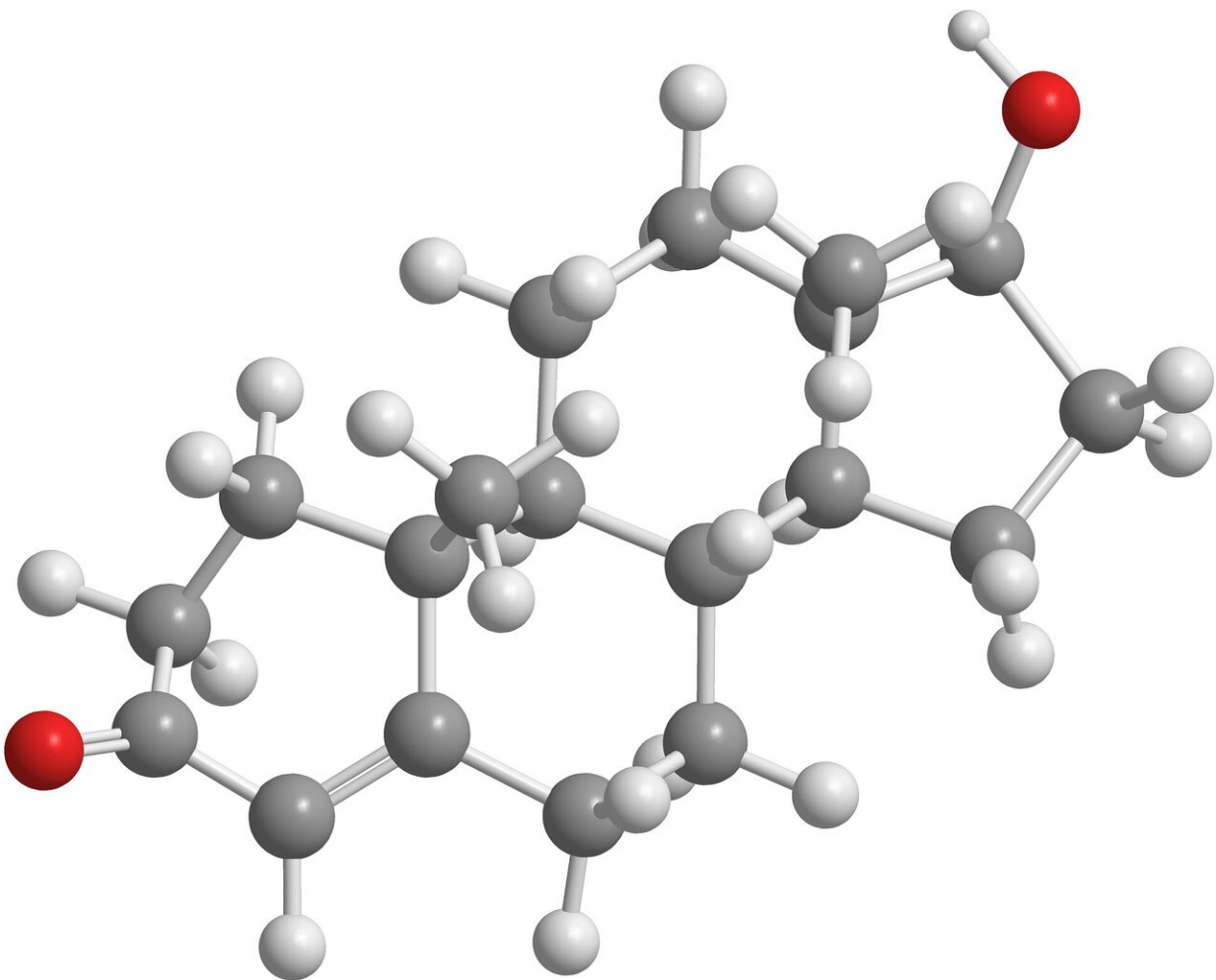


Prenatal exposure to phthalates may impact future fertility differently in males and females, animal study finds

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Prenatal exposure to chemicals called phthalates, which are used in hundreds of products, may lead to hormonal changes in females that could affect their future fertility, suggests a study in mice being presented Thursday at ENDO 2023, the Endocrine Society's annual meeting in Chicago, Ill.

The study found female mouse embryos exposed to phthalates during gestation had lower testosterone levels than those not exposed to the chemicals. Immediately after birth, female mice exposed to phthalates during gestation had lower levels of the hormone estradiol than those not exposed.

"These changes in [hormone levels](#) occurred during critical times in their development and could eventually lead to greater problems with fertility," said lead researcher Mary Bunnell of the University of Illinois Urbana-Champaign in Urbana, Ill.

During the middle of gestation and during the period right after birth, the body develops and changes significantly. At these times, elevated sex hormones are crucial for proper reproductive development and function. In males, the primary sex hormone is testosterone, which is associated with penile and testicular growth and the masculinization of neurons. In females, the primary sex hormone is estradiol, which stimulates [breast tissue](#) and acts as a growth hormone for the [reproductive organs](#). The rise in levels of these hormones allows for the maturation of the sexual organs and creates the basis for future fertility.

"The level of [sex hormones](#) during the fetal and neonatal periods are critical, and disruptions in the levels at these times can cause reproductive abnormalities that may not be evident until adulthood," Bunnell said.

Endocrine-disrupting chemicals such as phthalates are ubiquitous in our

environment, so it is extremely difficult to avoid exposure. According to the U.S. Food and Drug Administration, phthalates are used in the manufacture of toys, vinyl flooring and wall covering, detergents, lubricating oils, food packaging, pharmaceuticals, blood bags and tubing, and [personal care products](#), such as nail polish, hair sprays, aftershave lotions, soaps, shampoos and perfumes. They can leach from packaging and into the food we consume.

Ongoing research has revealed many health concerns linked with phthalate exposure, particularly of the reproductive system and other endocrine systems. Prepubescent children are especially at risk. It has been shown that phthalates can cross the placenta, putting the [developing fetus](#) at risk of gestational exposure to these dangerous chemicals during a sensitive period of development, Bunnell said.

In the new study, researchers studied two groups of mice. In one group, the researchers mimicked human exposure to phthalates by orally dosing pregnant mice with a phthalate mixture formulated to reflect the levels of phthalates found in humans. In the second group, pregnant mice were not exposed to phthalates. They measured fetal and newborn hormones of the offspring in both groups.

During gestation, female embryos exposed to phthalates had lower testosterone levels than non-exposed females. Female newborns had lower estradiol than non-exposed females. However, they did not find such changes in males. The results show that prenatal phthalate exposure had sex-dependent effects on hormonal levels at critical times of development. Follow-up study indicates that those sex-dependent [hormonal changes](#) are not due to the impact on gonadal sex steroid production in males and females, but a sex-dependent impact on the liver's metabolic capacity.

"This study initiates a new perspective on the reproductive toxicity of

phthalates, placing the liver as the primary target," Bunnell said. "It provides a unique approach to understanding sex-dependent effects of endocrine-disrupting chemicals, and it could pave the way for the development of clinical strategies to mitigate the effects of [phthalate exposure](#)."

Bunnell is scheduled to present at the Society's ENDO 2023 endocrine-disrupting chemicals news conference at 10 AM Central on Saturday, June 17.

More information: Conference livestream at endomediastream.com.

Provided by The Endocrine Society

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