Study finds link between exposure to synthetic progestin during development, impaired cognitive function

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The study reports effects similar to developmental disorders such as ADHD or autism.

Exposure to synthetic progestin – a steroid hormone used to prevent premature birth in at risk women – has been linked to impaired cognitive function in a recent animal study co-authored by University at Albany Psychologist Christine K. Wagner.

The results of an animal study, recently published in the journal *Endocrinology* show that exposure to synthetic progestin (17 alpha-hydroxyprogesterone caproate/17-OHPC) during development could impair brain function later in life.

Wagner, along with Jari Willing, of the University of Illinois at Urbana-Champaign, note that there is little information regarding the potential effects of 17-OHPC on the developing brain, and yet the drug is prescribed during the late-second and third trimesters and can be detected in maternal and fetal plasma long after injection.

If a mother is prescribed 17-OHPC, developing infants may be exposed to the hormone during critical periods of cortical development. Willing and Wagner used a rodent model to test the effects of 17-OHPC during development on cognitive flexibility—the ability to change strategy in light of shifting environmental contingencies—a process which they point out is highly dependent on dopaminergic activity in the prefrontal cortex. Rats were trained to use a rule to find a food reward, and then the rule was changed, so the rats had to shift to the new rule to find the food reward again.

They found that the rats exposed to 17-OHPC during development had a harder time shifting to the new rule compared to their control counterparts, continuing to use the first rule longer than controls. What's more, males seemed to have a harder time, suggesting that sex differences in exposure to the drug may exist.

The authors conclude that 17-OHPC exposure impaired cognitive flexibility and increased perseverative behavior in adulthood.

"The present findings reporting neurocognitive effects reminiscent of those often associated with developmental disorders such as ADHD and autism should highlight the need for additional research on the potential

effects in children. Ultimately, they should also contribute to the assessment of the benefits versus the potential risks of synthetic progestin administration in pregnant women," said Wagner.

More information: Jari Willing et al. Exposure to the Synthetic Progestin, 17α-Hydroxyprogesterone Caproate During Development Impairs Cognitive Flexibility in Adulthood, *Endocrinology* (2016). DOI: 10.1210/en.2015-1775