

Reduced hormone supply in pregnant mothers linked to ADHD in their children

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Low levels of key, body-regulating chemicals in mothers during the first three months of pregnancy may interfere with the baby's brain development, a large American study shows.

These chemicals, or hormones, are produced in the [thyroid gland](#) in the

neck and are known to influence fetal growth. Investigators have suspected that disruptions in their production, or hypothyroidism, may contribute to attention deficit/[hyperactivity disorder](#) (ADHD), which is the most common neurodevelopmental disorder of [children](#) in the U.S.

Led by an NYU Long Island School of Medicine researcher, the new investigation showed that children whose mothers were diagnosed with hypothyroidism shortly before or during the early stages of [pregnancy](#) were 24 percent more likely to have ADHD than children whose mothers did not have the diagnosis. The authors say their findings also show that boys born to hypothyroid women were four times more vulnerable to ADHD than girls whose mothers had hypothyroidism. Hispanic children born to hypothyroid mothers had the highest risk of any ethnic group studied.

"Our findings make clear that thyroid health likely has a much larger role in fetal [brain development](#) and behavioral disorders like ADHD than we previously understood," says study lead author Morgan Peltier, Ph.D. Peltier is an associate professor in the departments of Clinical Obstetrics, Gynecology, and Reproductive Medicine at NYU Winthrop Hospital, part of NYU Langone Health.

Among the study findings were that once a pregnancy had reached the second trimester, a woman's hypothyroidism had little effect on her children. A possible explanation, says Peltier, is that by this point, the fetus has begun to produce its own thyroid hormones and so is less vulnerable to its mother's deficiencies.

The new investigation, publishing Oct. 21 in the *American Journal of Perinatology*, followed 329,157 children from birth until age 17, all born in Kaiser Permanente Southern California hospitals. It is the first large-scale effort in the U.S. to examine a potential link between a mother's hypothyroidism and ADHD in her children, according to the study's

authors. The authors also note that unlike previous research in Europe, the new American study included people of diverse ethnic backgrounds and observed the children for nearly two decades. This long study period, lead author Peltier says, allowed the researchers to better capture cases of ADHD in the children as they aged and progressed through school.

As part of the new research, the team analyzed children's medical records and collected key information about their mothers, including age during pregnancy, race, and household income. All children were evaluated for ADHD using the same criteria, which the authors say helped to prevent inconsistencies in how cases of the disorder were identified.

According to the findings, overall 16,696 children were diagnosed with ADHD. Hispanic children whose mothers had low thyroid hormone levels during pregnancy had a 45 percent increased risk for the neurodevelopmental disorder compared with a 22 percent increased risk in white children whose mothers had the same condition.

Peltier says his team's results are strong enough to warrant careful monitoring of pregnant women with low thyroid hormone levels. He adds that children whose [mothers](#) had low thyroid hormone levels during pregnancy could potentially benefit from earlier surveillance for signs of ADHD, such as inattention, hyperactivity, and difficulty focusing on a task. Previous research has found that swift intervention can help manage ADHD and make it easier for children to succeed in the classroom and in learning social skills.

The study team next plans to investigate whether hypothyroidism during pregnancy can raise the risk of other neurodevelopmental disorders, such as epilepsy, cerebral palsy, and difficulties with speech. They also intend to explore other factors that may increase the risk of ADHD in children,

such as exposure during pregnancy to environmental toxins like flame retardants found in upholstered furniture, electronic devices, and other household appliances.

Provided by NYU Langone Health

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