Anti-asthma drugs taken during pregnancy associated with autism risk

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By comparing birth records over a period of nine years, Drexel researchers found that the children of mothers who took a certain asthma medication during pregnancy faced an elevated risk of being diagnosed

with autism spectrum disorder.

"Since the teratogenic [an agent which could cause development issues in a fetus] potential of most drugs with respect to neurodevelopmental outcomes is generally understudied, I would hope my research would encourage more researchers to explore prescription drug use as a potential autism spectrum disorder risk factor," said Nicole Gidaya, PhD, a doctoral alum of Drexel's Dornsife School of Public Health and the lead author of the study.

Looking at birth records from Denmark dating between 1997 and 2007, it was determined that children whose mothers took ß-2-andrenergic receptor (B2AR) agonist drugs during pregnancy were 30 percent more likely to be eventually diagnosed with autism spectrum disorder.

The study, "In Utero Exposure to ß-2-Andregenic Receptor Agonist Drugs and Risk for Autism Spectrum Disorders," was published in the February issue of *Pediatrics*.

Craig Newschaffer, PhD, professor in the Dornsife School of Public Health, and the director of the A.J. Drexel Autism Institute, is a co-author of the paper and helped conceptualize, design and acquire data for the study.

"This study adds to a body of recent research suggesting that medications used for certain common health conditions like asthma, when taken in pregnancy, may influence a newborn's neurodevelopment," Newschaffer said.

Drexel's Brian Lee, PhD, Igor Burstyn, PhD, and Yvonne Michael, ScD, were co-authors on the study, along with Erik Mortensen, of the University of Copenhagen.

B2AR agonist drugs—which include salmetereol and formoterol—are used to relax the bronchial passages in a person's lungs, providing a release from the constricting nature of asthma. According to the study, B2AR drugs can cross the placenta and reach the fetus, which may have an effect on its developing neurons.

Using Denmark's Civil Registration System, Gidaya and the research team drew their sample from births in Denmark between Jan. 1, 1996 and Dec. 31 2006. All children in the study could be tied to a biological mother who'd been living in Denmark for at least a year. As a result, 5,200 children were a part of the case group (those diagnosed with autism spectrum disorder) and 52,000 children were in the control group (those who were not diagnosed with autism spectrum disorder).

The study found that 3.7 percent of children diagnosed with autism spectrum disorder had mothers who took the ß-2-andrenergic receptor (B2AR) agonist drugs during pregnancy. Of children not diagnosed with autism spectrum disorder, 2.9 percent were born to mothers who took the drugs.

Children with mothers who filled their B2AR agonist prescriptions from 90 days before the estimated conception date all the way until their birth date were considered to be exposed to the drug. If a prescription was not filled throughout that entire period, the children were not considered to be exposed.

There was not a marked difference in the odds of a child eventually diagnosed with autism spectrum disease between each trimester (and the 90 days prior to conception). However, the study determined that there was a greater risk when B2AR agonists were taken throughout a pregnancy.

Although the study uncovered the potential risks posed by pre-natal

exposure to the drugs, immediately swearing off B2AR agonists could also be harmful. Uncontrolled asthma in pregnancy "has been associated with poor birth outcomes," according to the study, so completely halting the use of B2AR drugs may not be the perfect solution.

"A challenge here is that the effects of the underlying health conditions, themselves, can also influence developmental outcomes," Newschaffer said. "Newly pregnant women taking medication for asthma or other conditions need to work closely with their health care provider to weigh the benefits of continuing medication use against possible risks."

Additionally, the research team estimated that less than one percent of the autism spectrum disorder diagnoses in the entire population of the study (roughly 628,000 children) could be attributed to B2AR agonist drugs exposure.

Just one other study has considered prenatal B2AR agonist exposure before, but not close to this scale.

"Further research is needed before these results are taken into clinical consideration in the course of prenatal care," Gidaya said.

More information: *Pediatrics*, pediatrics.aappublications.org … 01/05/peds.2015-1316

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