Study: Metformin combined with insulin does not reduce pregnancy outcome risks compared to placebo

March 21 2023

Credit: Pixabay/CC0 Public Domain

A recent UNC-Chapel Hill School of Medicine study has concluded that metformin—a drug used to control high blood sugar—along with insulin

did not reduce risks for adverse neonatal outcomes compared with a placebo along with insulin in pregnancies with type 2 diabetes.

Kim Boggess, MD, a professor of maternal-fetal medicine in the UNC Department of Obstetrics & Gynecology, served as principal investigator of the study. The study findings were reported at the annual meeting of the Society for Maternal Fetal Medicine.

"The primary outcome rate was much higher than we anticipated, highlighting the challenges in caring for these patients," Boggess said. "Also, we did not replicate previous data showing less maternal weight gain in patients who use metformin."

The Medical Optimization and Management of Pregnancies with Overt type 2 Diabetes (MOMPOD) study was conducted between 2016 and 2022.

The long-term goal of MOMPOD was to optimize maternal and infant outcomes in overt type 2 diabetes-complicating pregnancies, which number over 100,000 in the U.S. every year. Over one-third infants born to women with overt type 2 diabetes experience an adverse outcome such as premature delivery, large-for-gestational age, hypoglycemia, hyperbilirubinemia, or birth trauma, suggesting that current treatment regimens fall short of optimizing outcomes.

Medical treatment of overt type 2 diabetes in pregnancy is generally restricted to insulin. Metformin is the pharmacologic treatment of choice for overt type 2 diabetes outside of pregnancy and is favored over insulin due to less weight gain, fewer hypoglycemic episodes, and is oral rather than injectable. Metformin's mechanism of action directly counteracts the insulin resistance characteristic of type 2 diabetes.

Boggess and her team conducted a multicenter trial to evaluate adverse

outcomes among more than 800 women with type 2 diabetes diagnosed before pregnancy or before 22 weeks' gestation. Participants were randomly assigned 1:1 to insulin and metformin or insulin and placebo until delivery. The researchers also assessed maternal hypoglycemia and neonatal fat mass at birth.

Composite adverse neonatal outcome was comparable between the two study groups. However, neonates in the metformin group were smaller and less likely to be born large for gestational age. This difference in birthweight did not affect the mode of delivery, as there was no difference in the rate of cesarean delivery between groups. There were also no differences between groups for babies born small for gestational age.

In planned subgroup analyses of women with a BMI greater than 30 kg/m^2 or pregestational diabetes, there were also no differences in composite adverse neonatal outcome.

Further, there were no differences in maternal or neonatal adverse outcomes between groups.

"For populations comparable to our study group, the use of metformin to treat type 2 diabetes complicating pregnancy should be discouraged," Boggess said. "Future research should focus on long-term follow-up of children born to patients who used metformin for type 2 diabetes."

Provided by University of North Carolina at Chapel Hill School of Medicine