Mother's age, race, weight affect hormone concentrations in pregnancy, study finds

February 4 2019, by Patti Verbanas

Credit: CC0 Public Domain

Hormone concentrations during early fetal development—that may affect the child's development and increase the mother's risk for breast and ovarian cancer years later—are significantly affected by maternal age, body mass index and race rather than lifestyle, according to a

Rutgers study.

The findings appear in *Maternal and Child Health Journal*.

The researchers looked at the concentrations of estrogens and testosterone in 548 healthy women in the first trimester of pregnancy in relation to their lifestyle to better understand what drives elevated sex hormones during fetal development.

"Hormones in early development play a key role in human health and disease risk. Since we are unable to directly measure hormones in fetuses as they are developing, the next best way is to study the mother's hormones since they can be transferred to the fetus," said Emily Barrett, an associate professor at Rutgers School of Public Health and a faculty member at Rutgers Environmental and Occupational Health Sciences Institute.

Previous studies have suggested that excess fetal exposure to estrogens and androgens, which are male sex hormones such as testosterone, may play a role in future risk of reproductive cancers and other conditions such as polycystic ovary syndrome, endometriosis, prostate cancer and semen quality in the infant.

In the new study, researchers recruited women during early pregnancy and collected a blood sample to measure hormones. The participants completed questionnaires with items on demographics as well as lifestyle factors, including their alcohol or tobacco use, and stressors in their lives

Most of the women were white, married, well-educated and had an average age of 31. Less than 5 percent drank alcohol and less than 8 percent smoked. The researchers found that older mothers and women who had previously given birth had lower estrogen and testosterone levels. They also found that heavier women had lower estrogen levels,

but higher testosterone levels than leaner women. Confirming results from previous work, they found that black women had higher testosterone levels than women of other races, a difference that may help to explain health disparities in reproductive cancers and other hormone-sensitive diseases.

According to the Centers for Disease Control and Prevention, black women and white women get breast cancer at about the same rate, but black women die from breast cancer at a higher rate than white women.

The study found no variation in maternal hormone concentrations in relation to fetal sex, stressful life events during pregnancy or lifestyle factors such as smoking and alcohol use, suggesting that hormone concentrations were not influenced by maternal behaviors or the gender of the fetus.

"Characterizing sex steroid concentrations during pregnancy may yield important insights into the mother's own future risk of disease as high levels of exposure to estrogen have been shown to increase the risk for breast and ovarian cancer later on," said Barrett, whose research focuses on prenatal exposure to endocrine disruptors, agents which interfere with the normal activity of hormones in the body.

More information: Emily S. Barrett et al, Predictors of Steroid Hormone Concentrations in Early Pregnancy: Results from a Multi-Center Cohort, *Maternal and Child Health Journal* (2019). DOI: 10.1007/s10995-018-02705-0

Provided by Rutgers University