

Study finds preconception stress may affect health of women undergoing fertility treatment

January 4 2024



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Stress during pregnancy is known to influence health outcomes, but a new study from Mass General Brigham researchers suggests that stress levels before pregnancy are also important to evaluate.

Investigators at Massachusetts General Hospital and Brigham and Women's Hospital analyzed the link between self-reported [stress](#) immediately before conception among women seeking fertility care and [blood glucose levels](#), a marker of heart health.

The team found that maternal stress during preconception was associated with higher blood glucose levels, especially among women using intrauterine insemination to conceive and women of higher socioeconomic status. Results are [published](#) in the *Journal of the Endocrine Society*.

"Stress prevalence has increased over the years, particularly for couples who are not able to conceive naturally," said corresponding author Lidia Mínguez-Alarcón, Ph.D., MPH, Bpharm, a reproductive epidemiologist in the Brigham's Channing Division of Network Medicine and co-investigator of the Environment and Reproductive Health (EARTH) study. "We wanted to evaluate how this stress affects health during pregnancy, which can affect both the mother and child in the long term."

Mínguez-Alarcón and colleagues analyzed data from the EARTH study conducted at the Massachusetts General Hospital Fertility Center from 2004 to 2019 for 398 women between 18 and 45 years of age. The women self-reported preconception-perceived stress at study entry.

Additional clinical characteristics and sociodemographic information, including family and medical history, consumer products use and smoking history, were either collected by the study staff through medical records or questionnaires.

Women had a median age of 35 years at study entry, and most were of white ethnic background (83%), reported never smoking (78%), and were at least college educated (64%). Three hundred of the women conceived using medically assisted technologies like [intrauterine](#)

[insemination](#) (IUI) or in vitro fertilization (IVF).

During IUI, sperm is injected directly into the uterus while IVF is a multi-step technology that involves retrieving an egg for fertilization in a lab before transfer back to the uterus. Glucose testing was done at a median of 26 weeks into pregnancy and taken one hour after the women drank a 50 gram glucose solution. A [blood sugar](#) that was equal to or less than 140 mg/dL was considered normal.

Researchers found that blood sugar levels, a measure of cardiovascular health, were abnormally high in 82 of the women involved. Previous studies have shown that women with a history of gestational diabetes (GD) during pregnancy are at increased risk of developing type 2 diabetes as well as cardiovascular problems later in life, including heart artery calcification.

The team found that women who experienced higher preconception stress had higher mean glucose levels. In addition, women who conceived through IUI had both higher stress and blood sugar levels than those who conceived through IVF. The study also found that women of higher socioeconomic status had higher levels of preconception stress and blood glucose levels during their pregnancy. Median family income was used to measure socioeconomic status.

"Professional women with higher incomes and attained education levels may be employed in demanding, time-intensive jobs and are often also responsible for balancing demands in the workplace with household duties and childcare," Mínguez-Alarcón said.

"It has previously been shown that women with a higher education level experience greater levels of job stress. Given that education level is positively associated with salary, it is possible that this explanation applies to women with higher incomes as well."

Still, findings are limited since the study comprises a group of mostly white women of high socioeconomic status seeking fertility care. Self-reporting perceived stress may also result in participant bias. Future research can investigate additional variables like sleep quality or neighborhood safety as well as the effect of preconception stress on the baby's health.

"Our results are of public health importance given the increasing rates of stress over the years and its effect on cardiovascular health," Mínguez-Alarcón said.

"Women can try to lower their [stress levels](#) through a variety of strategies like being more active, avoiding alcohol and drugs, eating healthy and avoiding isolation. Given the scarce literature in this field, our study has the potential to start important discussions."

More information: Lidia Mínguez-Alarcón et al, Preconception stress and pregnancy serum glucose levels among women attending a fertility center, *Journal of the Endocrine Society* (2023). [DOI: 10.1210/jendso/bvad152](#)

Provided by Mass General Brigham

Citation: Study finds preconception stress may affect health of women undergoing fertility treatment (2024, January 4) retrieved 13 May 2024 from <https://medicalxpress.com/news/2024-01-preconception-stress-affect-health-women.html>

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