

Pregnant women with polycystic ovary syndrome at risk of heart complications during delivery, study finds

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Baby on mother's belly right after birth. Credit: Tom Adriaenssen/Wikipedia, CC BY-SA 2.0

A common hormone disorder among women of reproductive age has been linked to an increased risk of adverse cardiovascular events and pregnancy outcomes at the time of birth, according to a new study led by Johns Hopkins Medicine researchers.

The study was published June 16 in the *Journal of the American Heart Association*.

Polycystic ovary syndrome (PCOS) affects an estimated 5%–13% of women in the general population. It causes irregular periods, excess levels of male hormones (androgens) and, at times, infertility. Building on previous research that shows PCOS is linked to future cardiovascular disease risks later in life, the new findings reveal that it can also significantly increase [heart problems](#) among pregnant women during delivery. These problems include preeclampsia (dangerous levels of high blood pressure with organ damage), peripartum cardiomyopathy (a weak or enlarged

heart), [heart failure](#), abnormal heart rhythms and venous thromboembolism (blood clots), compared with women without PCOS.

"Oftentimes, women with PCOS are understandably concerned about the immediate effects, like an irregular menstrual cycle, excess body hair, weight gain and acne. However, the long-term cardiovascular complications are also a serious problem," said Erin Michos, M.D., associate professor of medicine at the Johns Hopkins University School of Medicine and corresponding author of the study. Michos said the new study should encourage women with PCOS to live a heart-healthy lifestyle before, during and after pregnancy to reduce the risk of adverse outcomes.

For the study, researchers analyzed data gathered on more than 17 million U.S. births between 2002 and 2019 drawn from the National Inpatient Sample. Among those with hospitalized deliveries, 195,675 had PCOS. The prevalence of PCOS—and obesity among those with the hormone disorder—increased significantly during the study period. The number of women with PCOS went from a reported 569 per 100,000 deliveries in 2002 to 15,349 per 100,000 deliveries in 2019. During that same time period, obesity also skyrocketed from 5.7% to 28.2% among women with PCOS. Michos and colleagues note that some of the increase in PCOS may be due to better detection and diagnosis.

After adjusting for age, race, other disorders not related to PCOS, insurance coverage and income, PCOS remained an independent predictor of heart complications during delivery compared with women who did not have the hormone disorder. Complications included preeclampsia, with a 56% increased comparative risk; heart failure, with a 76% increased risk; [abnormal heart rhythms](#), with a

two-fold higher risk; weakened heart, with a 79% higher risk; and an 82% higher risk of developing blood clots.

Women with PCOS were overall older (31 versus 28) and had a higher prevalence of diabetes, obesity and high cholesterol. The study also found Black women with PCOS were at greater risk for preeclampsia and other adverse outcomes.

"Currently, the overall goal is to reduce the rising mortality rate among [pregnant women](#) in the U.S., with a mission of identifying risk factors. Our study shows that PCOS is indeed a risk factor for acute cardiac complications at the time of delivery and should be taken seriously," says Salman Zahid, M.D., a resident physician in the Rochester General Hospital Internal Medicine Residency program in Rochester, New York, and lead author of the study. "We want to stress the importance of optimizing the cardiovascular health of women with PCOS with prevention efforts, especially Black women and lower socioeconomic groups because we believe that those are the most vulnerable populations and will benefit most from intervention."

In a separate meta-analysis (an analysis combining multiple studies) published May 16 in the *Journal of Women's Health*, Michos and her colleagues found that women with PCOS are two times more likely to have [coronary artery calcification](#) (CAC), a marker of subclinical atherosclerosis (an early indicator of atherosclerosis, a build-up of fats and cholesterol in the artery walls). CAC occurs when plaque builds up in the arteries and becomes calcified. It is a marker of atherosclerosis, even without symptoms, and a reliable predictor of cardiovascular disease risk.

Women with PCOS are at an increased risk for dyslipidemia (an imbalance of lipids), type 2 diabetes, hypertension and heart disease. Michos says detecting CAC early in women with PCOS is key to preventing future cardiovascular disease risk.

"These findings suggest that coronary calcium should be considered a risk factor for heart disease for women over 40," Michos says. "Do [women](#) with PCOS need statins? Well if they have coronary

calcium indicating atherosclerosis, then they do. This could potentially be a tool to risk stratify PCOS."

Michos emphasizes these two studies together highlight the cardiovascular risks associated with PCOS, both during pregnancy and long term. Cardiovascular risk factor screening remains critical in this patient population, but reduction in cardiovascular risk is achievable with a combination of healthy lifestyle choices and drug therapy, when indicated, for prevention.

More information: Salman Zahid et al, Trends, Predictors, and Outcomes of Cardiovascular Complications Associated With Polycystic Ovary Syndrome During Delivery Hospitalizations: A National Inpatient Sample Analysis (2002–2019), *Journal of the American Heart Association* (2022). [DOI: 10.1161/JAHA.121.025839](https://doi.org/10.1161/JAHA.121.025839)

Olatokunbo Osibogun et al, A Systematic Review and Meta-Analysis of the Association Between Polycystic Ovary Syndrome and Coronary Artery Calcification, *Journal of Women's Health* (2022). [DOI: 10.1089/jwh.2021.0608](https://doi.org/10.1089/jwh.2021.0608)

Provided by Johns Hopkins University School of Medicine

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