Newly approved blood test can help predict severe preeclampsia diagnoses earlier and more accurately

June 12 2023

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For decades, doctors have typically relied on measuring blood pressure and proteins in urine to determine whether a woman will develop

preeclampsia, a serious hypertensive disorder that affects roughly 2% to 8% of pregnant women worldwide. However, these tests are poor predictors of whether a woman will develop severe preeclampsia, especially as pregnancy progresses.

But a blood test newly approved by the FDA can now help doctors in the United States predict earlier and more accurately whether a woman will develop severe preeclampsia during pregnancy.

This first-of-its-kind prognostic test works by detecting sFlt1 and PlGF, two proteins in the blood that predict poor outcomes from preeclampsia with substantially better accuracy than the current methods. The test can be used between 23 and 35 weeks of pregnancy to predict development of severe preeclampsia among women who have symptoms of, or have been diagnosed with, hypertension during pregnancy.

"Doctors can use this in conjunction with other clinically available tests to stratify their patients to determine whether they're at high risk for severe preeclampsia and complications, or at low risk, to be managed appropriately," said Sarosh Rana, MD, MPH, chief of maternal-fetal medicine at the University of Chicago Medicine.

Rana studied sFlt1 and PlGF biomarkers to predict and define preeclampsia in patients and worked towards the FDA approval for over a decade with long-time collaborators at Cedars-Sinai Medical Center in Los Angeles. The test or certain components of the test are already being used in countries like Europe, Canada and Asia.

While preeclampsia is characterized primarily by high blood pressure, other signs include elevated amounts of protein in the urine and organ damage. Although some women experience no symptoms, it is a common cause for maternal and fetal complications as well as preterm delivery.

There is no specific diagnostic test for preeclampsia, and the only way to cure it is by delivering the baby and the placenta (the latter is believed to cause the disease). If the baby is too young to survive outside of the womb, doctors attempt to manage the mother's illness expectantly with antihypertensive medications, magnesium and steroids.

The effects of preeclampsia can also be lifelong.

"Women who have preeclampsia are at higher risk for short-term and long-term hypertensive disorders and cardiovascular disease for the remainder of their lives," said Rana.

For women who test negative and are deemed to be at low risk, the test could mean shorter hospital stays and fewer, if any, steroid treatments. Patients deemed high-risk by the test could be transferred to a higher level of care center best prepared to handle maternal complications and preterm delivery. The test could likewise reduce the rate of preterm delivery among patients who doctors suspect, but cannot confirm, have preeclampsia, something Rana hopes to collect data on.

Rana similarly expects the test will improve the bleak disparity pregnant Black women face when it comes to preeclampsia: they are 60% more likely to develop it than pregnant white women and have much higher rates of complications from preeclampsia. (In one recent study done at UChicago Medicine with a large cohort of high-risk pregnant women, Rana showed these biomarkers predict adverse outcomes among Black women.)

Discovering better methods for diagnosing and treating preeclampsia has been Rana's lifework. She has published more than 100 papers evaluating the use of biomarkers for predicting preeclampsia and its related complications. In one of the first and largest prospective studies done in the United States, Rana enrolled more than 1,000 patients being

evaluated for preeclampsia. In women with suspected preeclampsia presenting at less than 34 weeks, the circulating sFlt1/PlGF ratio predicted adverse outcomes with substantially better accuracy than current approaches. More recently, Rana was a key author in the study submitted to the FDA for approval of the clinical use of biomarkers. She also enrolled the largest number of patients from UChicago Medicine (*NEJM Evidence*, 2023).

Rana plans to work with the Department of Clinical Chemistry at UChicago to offer the test to patients. She is planning further research to examine the real-world impact of biomarkers in clinical practice, therapies based on angiogenic proteins, and the potential widespread use of biomarkers to reduce the excess morbidity and mortality among women with preeclampsia in the United States.

Provided by University of Chicago Medical Center

Citation: Newly approved blood test can help predict severe preeclampsia diagnoses earlier and more accurately (2023, June 12) retrieved 28 April 2024 from https://medicalxpress.com/news/2023-06-newly-blood-severe-preeclampsia-earlier.html