Protein biomarkers identified in women who developed perinatal depression and anxiety

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Cedars-Sinai investigators found that women who developed mood and anxiety disorders associated with pregnancy and childbirth had specific

altered proteins circulating in their bloodstream in the third trimester.

The study is published in the *American Journal of Obstetrics & Gynecology*.

"In this pilot study, we found that participants with perinatal mood and anxiety disorder (PMAD) symptoms had a unique and distinct prenatal plasma protein signature that regulated certain brain signaling activity and pro-inflammatory pathways," said Eynav Accortt, Ph.D., director of the Reproductive Psychology Program at Cedars-Sinai and corresponding author of the study.

The controlled pilot study included 34 women at risk for developing PMAD and 18 controls. Mental health screening was conducted in the third trimester and again three months after giving birth. Investigators used a highly sensitive tool called slow off-rate modified aptamers (SOMA) scan technology to detect plasma biomarkers correlated with specific disorders, such as anxiety, depression and post-traumatic stress.

According to the Centers for Disease Control and Prevention, about 1 in 8 women experience significant symptoms of perinatal mood and anxiety disorders that can interfere with overall health, daily activities and family life.

"The critical first step in prevention of any disease is knowing if you are at risk. The process of discovering a diagnostic test for perinatal mood and anxiety disorders, through biomarker research like this, is our holy grail," said Accortt, a clinical psychologist.

"It can be incredibly challenging for a woman who is distressed to identify her need for intervention. Family members and friends can look for red flags but may not know how to help. If we had an early blood test, like the test all women take for gestational diabetes, she and her

family would know that she is at higher risk and begin to get education and consider treatment options much earlier," said Accortt.

A previous study led by Accortt and published in the *American Journal of Reproductive Immunology* found that women with prolonged mental health problems up to three years after childbirth may be suffering from chronic irregularities in their immune system.

Larger validation studies are needed to determine whether biomarkers identified in this pilot study can be used with traditional risk factors—such as a previous history of depression or medical complications during pregnancy or childbirth—to develop protocols for early detection.

The financial and societal costs for untreated maternal mental illness are enormous. One study published in the *American Journal of Public Health* estimated the national cost in 2017 to be $14 billion.

"In addition to the financial costs of mood disorders associated with pregnancy and childbirth, including reduced economic productivity and more preterm births, children and the family structure can be deeply affected. We need research-based diagnostics developed so we can help women find a pathway to wellness and be able to emerge out of the shadow of debilitating mood disorders that harm their health and the health of their families," said Sarah Kilpatrick, MD, Ph.D., chair of the Department of Obstetrics and Gynecology at Cedars-Sinai and study co-author.

More information: Eynav Accortt et al, Perinatal mood and anxiety disorders: biomarker discovery using plasma proteomics, *American Journal of Obstetrics and Gynecology* (2023). DOI: 10.1016/j.ajog.2023.01.012

Jennifer M. Nicoloro-SantaBarbara et al, Immune transcriptional profiles in mothers with clinically elevated depression and anxiety symptoms several years post-delivery, *American Journal of Reproductive Immunology* (2022). DOI: 10.1111/aji.13619