

# New study finds early detection of miRNAs in maternal blood may offer potential for predicting preeclampsia

July 16 2024

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Preeclampsia (PE) is a significant contributor to the increase in maternal morbidity and mortality worldwide, with particularly alarming numbers

in the United States, where it affects about 2–8% of pregnancies, resulting in premature birth with associated morbidities for their infants as well. A new study by researchers at UCLA Health finds that early detection of specific microRNAs (miRNAs) packaged in vesicles may offer the opportunity to predict preeclampsia in pregnant people before clinical symptoms manifest.

The work appears in *Scientific Reports*.

The study, led by Dr. Sherin U. Devaskar, MD, executive chair of the Department of Pediatrics and physician-in-chief at UCLA Mattel Children's Hospital, identifies the potential of a specific set of miRNAs within extracellular vesicles (EVs)—tiny particles that transfer information between cells—as a noninvasive biomarker for preeclampsia.

The study involved a comprehensive analysis of 33 participants, including a [control group](#) of seven non-pregnant women and a sub-group of 12 women with healthy pregnancies. The remaining 14 women exhibited clinical symptoms of preeclampsia, forming a critical part of the study's focus on early detection and prediction of the condition.

Compared to women with healthy pregnancies, women with preeclampsia had miRNAs found within EVs in early pregnancy. Researchers identified 148 miRNAs with differential abundance in preeclampsia EVs: 12 in higher amounts and 135 in lower amounts compared to EVs from healthy pregnancies. Specific groups of miRNAs showed clear differences in how many were present in EVs from women with preeclampsia.

The EVs taken from the blood of pregnant [women](#) with preeclampsia contained a group of microRNAs starting as early as the first to the second trimester of pregnancy. These miRNAs follow a specific pattern

throughout pregnancy that changes when preeclampsia develops. Some miRNAs originate from the placenta and act as messengers between the placenta and other organs in the body. The authors say this panel of miRNAs has the potential to predict the development of symptoms of preeclampsia, especially late-onset preeclampsia.

"It is critical that we take steps toward early detection and prevention of preeclampsia," said Devaskar. "It continues to be the leading cause of maternal mortality and morbidity worldwide, and our findings underscore the potential to address this persistent public health concern."

The findings suggest a future in which miRNAs within EVs could transform the current monitoring and care of mothers everywhere. They would serve as noninvasive biomarkers for early detection of preeclampsia in [pregnancy](#) and significantly enhance the understanding of the condition's pathophysiology.

**More information:** Circulating Extracellular Vesicular MicroRNA Signatures in Early Gestation Show an Association with Subsequent Clinical Features of Pre-Eclampsia, *Scientific Reports* (2024). [DOI: 10.1038/s41598-024-64057-w](#)

Provided by University of California, Los Angeles

Citation: New study finds early detection of miRNAs in maternal blood may offer potential for predicting preeclampsia (2024, July 16) retrieved 12 September 2024 from <https://medicalxpress.com/news/2024-07-early-mirnas-maternal-blood-potential.html>

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