

Women with preeclampsia have fewer blood vessel precursor cells, research finds

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Compared to women with uncomplicated pregnancies, women with preeclampsia have reduced numbers of special cells that are thought to help grow and maintain blood vessels, according to a study by researchers at the Magee-Womens Research Institute (MWRI) and the University of Pittsburgh School of Medicine. The findings are available online in *Reproductive Sciences*.

As a healthy pregnancy progresses, two types of endothelial progenitor cells (EPCs) increase in number, possibly indicating the augmentation of the mother's [cardiovascular system](#) to meet the need of the growing fetus, explained senior author Carl A. Hubel, Ph.D., an MWRI associate investigator and an associate professor of obstetrics, gynecology and reproductive sciences at Pitt.

But this adaptation doesn't happen in patients with preeclampsia, a pregnancy disorder characterized by [high blood pressure](#) and protein overload in the third trimester. Preeclampsia is the leading cause of preterm labor.

"When we examined blood samples from these [women](#), we found they had far fewer EPCs," Dr. Hubel said. "We wouldn't have been able to tell them apart from women who weren't pregnant or men."

The researchers drew blood samples during the first, second or third trimester from 52 healthy women expecting their first child; 14 with preeclampsia expecting their first child; and 13 women who had never been pregnant.

In addition to the reduced numbers of EPCs, preeclampsia samples showed alterations in key signaling molecules that may contribute to the mobilization of [precursor cells](#) into the circulation.

The researchers also collected third trimester blood samples from other groups of 11 women with

preeclampsia and 12 healthy pregnant women.

From those samples, they cultured cells known as circulating angiogenic cells (CACs), which are a type of progenitor cell thought to secrete growth factors to support cells that regenerate the vascular endothelium, or blood vessel lining. Cultures from preeclampsia samples grew fewer CACs.

"Still, it's not clear to us whether these differences are the cause of preeclampsia or are a consequence of it," Dr. Hubel noted. "We need to monitor women throughout pregnancy to see if we can figure out what came first, as well as get a better understanding of how all these cells work."

He added that studying women with [preeclampsia](#) after pregnancy also would be valuable because of the relationship between low numbers of EPCs and the development of cardiovascular disease.

Provided by University of Pittsburgh

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