

A pregnancy ended by COVID-19 informs new understanding and protocols

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When the first pregnant woman diagnosed with COVID-19 was admitted to Yale New Haven Hospital in March, she was in her second trimester and critically ill. At the time, almost nothing was known about how the

novel coronavirus disease impacted pregnant mothers and their unborn children.

Yale physician-scientists acted quickly not only to save the mother, who had severe early-onset preeclampsia, but also to collect samples that might help them better understand the disease.

According to a case report, published Sept. 1 in the *Journal of Critical Investigation*, the virus had crossed into the woman's placenta, likely driving her underlying [high blood pressure](#) to dangerous levels—an insight that sheds new light on how COVID-19 can accelerate pregnancy-related diseases.

"I am interested in hypertension in pregnancy," said Dr. Heather S. Lipkind, associate professor of obstetrics, gynecology, and reproductive sciences and lead author of the study. "And hers was very severe, and very unusual."

The presence of the virus in the woman's placenta, at levels higher than elsewhere in her body, triggered a very specific pathology that appeared similar to a rare condition called histiocytic intervillitis — an inflammatory response that is associated with severe adverse pregnancy outcomes, Lipkind said. It has since been observed in other COVID-19 cases in pregnant [women](#).

Because the 35-year-old woman had experienced gestational hypertension—or high blood pressure—during a previous pregnancy, she had underlying [risk factors](#) for preeclampsia in this pregnancy. In preeclampsia, high blood pressure can lead to organ damage and become fatal for both mother and baby.

It's likely that the patient's COVID-19 infection drove her placental inflammation and high blood pressure into dangerous preeclampsia

much faster and much earlier in the pregnancy, Lipkind said.

"Preeclampsia is a vascular issue," she said, "and with COVID-19 we're seeing lots of vascular complications leading to heart disease, stroke, and neurological conditions."

The only treatment for preeclampsia is delivery. In this case, doctors were forced to deliver the baby before it was viable in order to save the mother's life.

Since the case report was published, other reports have confirmed transplacental transmission of COVID-19, said Lipkind. As a result of this study and others, she said, every pregnant woman who comes to Yale's labor and delivery units is tested for COVID-19, regardless of whether they are symptomatic, for the protection of both [pregnant women](#) and healthcare providers.

A study in New York found that 13.5% of women (29 out of 215) presenting for childbirth between March 22 and April 4 had asymptomatic COVID-19. A study at Yale, published in the *Journal of the American Medical Association*, conducted between April 2 and 29 at three Yale New Haven Health hospitals, found that 2.9% of women (22 out of 756) presenting for childbirth had asymptomatic COVID-19.

While it is not known what factors increase the chances of the novel [coronavirus](#) being transmitted from a pregnant mother to her unborn child, such transmission appears to be extremely rare. But, Lipkind said, there are increasing concerns about the lingering effects of COVID-19 on new mothers, including the danger of postpartum preeclampsia and chronic hypertension.

A study Lipkind is leading at Yale called [Yale Hearts Moms](#) is helping to ensure that women receive the follow-up care they need after childbirth.

Participants, all of whom have delivered a baby within the past year, receive blood sugar, [blood](#) pressure, and cholesterol screenings in order to understand whether they are at risk for heart disease and what preventative steps they should take. Women who have had [preeclampsia](#) in particular are encouraged to enroll.

More information: Hillary Hosier et al. SARS–CoV-2 infection of the placenta, *Journal of Clinical Investigation* (2020). [DOI: 10.1172/JCI139569](#)

Katherine H. Campbell et al. Prevalence of SARS-CoV-2 Among Patients Admitted for Childbirth in Southern Connecticut, *JAMA* (2020). [DOI: 10.1001/jama.2020.8904](#)

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