Pregnant patients with anxiety shown to have altered immune systems

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The immune system of pregnant women with anxiety is biologically different from that of pregnant women without anxiety, according to new research from Weill Cornell Medicine, Johns Hopkins University School of Medicine and Columbia University Irving Medical Center investigators.

The study, published Sept. 14, 2022 in *Brain, Behavior and Immunity*, demonstrates that pregnant women with anxiety have higher levels of certain immune cells known as cytotoxic T cells; these cells attack infected or otherwise compromised cells within the body. Women with anxiety also showed differences in the activity of immune markers that circulate in the blood. This is the first known study to evaluate the relationship of anxiety to the trajectory of immune changes over the course of pregnancy and the postpartum period.

"Women with anxiety appear to have an immune system that behaves differently from that of healthy women during pregnancy and after delivery," said principal investigator Dr. Lauren M. Osborne, vice chair for clinical research for the Department of Obstetrics and Gynecology at Weill Cornell Medicine, who conducted the research while on Johns Hopkins University School of Medicine's faculty. "During pregnancy, a delicate dance is supposed to occur, in which the immune system changes so that it does not reject the fetus but is still strong enough to keep out foreign pathogens."

This study could encourage better treatment of anxiety in pregnant patients, said Dr. Osborne, who is also a reproductive psychiatrist at NewYork-Presbyterian/Weill Cornell Medical Center. As a clinician, she finds that women with anxiety may resist taking antianxiety medications because they fear the drugs will hurt the baby, despite evidence that they are compatible with pregnancy.

Anxiety during pregnancy, which is self-reported by more than 20 percent of people, according to the researchers, is already known to be detrimental to the parent and child. For example, it can increase the risk of preterm birth and a lower newborn birth weight.

For this study, Dr. Osborne and her colleagues assessed a group of 107 pregnant women, 56 with anxiety and 51 without anxiety, during their

second and third trimesters and at six weeks postpartum. The researchers evaluated blood samples for immune activity and conducted psychological evaluations to detect clinical anxiety.

They found that in the women with anxiety, levels of cytotoxic T cells were elevated during pregnancy and then decreased in the weeks following childbirth. In women without anxiety, the activity of these cells declined in pregnancy and continued to decline after birth.

The researchers also observed that the activity of largely pro-inflammatory cytokines, or substances secreted by cells as part of the immune system response, was suppressed during pregnancy in women with anxiety and then rose after childbirth, while healthy women exhibited the opposite pattern.

"The takeaway is that this is the first clear evidence that immune activity differs for pregnant women depending on their anxiety status. Knowing that there is immune system involvement is a first step toward understanding the biological factors related to anxiety in pregnancy, and a first step toward developing new treatments," said Dr. Osborne. "We know that anxiety needs to be treated to ensure healthy outcomes for both mother and child."

More information: Morgan L. Sherer et al, The immune phenotype of perinatal anxiety, *Brain, Behavior, and Immunity* (2022). DOI: 10.1016/j.bbi.2022.09.005

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