Transcript Details
This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: https://reachmd.com/programs/advances-in-womens-health/understanding-the-biology-and-burden-of-postpartum-depression/56554/

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Understanding the Biology and Burden of Postpartum Depression

Announcer:
This is *Advances in Women's Health* on ReachMD. On this episode, Dr. Jennifer Payne will share insights on the pathophysiological mechanisms behind postpartum depression. She's the Director of the Reproductive Psychiatry Research Program and a professor in the Department of Psychiatry and Neurobehavioral Sciences at the University of Virginia School of Medicine in Charlottesville. Here's Dr. Payne now.

Dr. Payne:
Postpartum depression is a major depressive episode that occurs in the immediate postpartum time period in the context of rapid reproductive hormonal change. We know that a good portion of cases are triggered by those hormonal changes that occur at the time of delivery.

During pregnancy, estrogen and progesterone rise slowly but significantly, and after delivery, they drop precipitously. We think that drop can trigger a depressive episode in women whose central nervous systems or brains are sensitive to times of hormonal change. It is likely that these significant changes dysregulate mood-related neural circuits and result in the chemical changes in the brain that we associate with major depression.

Allopregnanolone is a neuroactive steroid that is found both peripherally and in the brain, and it influences the GABAergic system. The GABAergic system is responsible for modulating the hypothalamic-pituitary-adrenal axis. Now, the HPA axis is what responds to stress, and when the HPA axis gets active, the GABAergic system is responsible for calming it back down and maintaining homeostasis. Allopregnanolone acts on the $GABA_A$ receptor, and it's called a positive allosteric modulator of the $GABA_A$ receptor, which means it activates the receptor to activate GABA within the central nervous system. So allopregnanolone essentially results in the calming of the central nervous system and the HPA axis. In the setting of the hormonal changes associated with delivery, allopregnanolone levels decrease significantly, and it is thought that that leaves the brain vulnerable to the stress of becoming a parent and the sleep deprivation that occurs after delivery.

We know that pregnancy is associated with suppression of the immune system. Then, immediately after delivery, the postpartum time period is associated with an immune rebound effect, and in fact, we can see a rebound of autoimmune diseases because of that rebound of the immune system. Elevated pro-inflammatory cytokines can be increased in the immediate postpartum time period, and those have been associated with the development of depressive symptoms, including outside of the postpartum time period. So we think that inflammation and a rebound of the immune system can interact with those hormonal changes and increase the risk for postpartum depression.

There are structural and functional brain changes associated with PPD. In fact, there are brain changes associated with pregnancy itself. We have recent evidence that the brain is very plastic during the course of pregnancy and that there's a restructuring of parts of the brain that likely results in normal maternal behavior. We know that there are alterations observed in regions like the amygdala, the prefrontal cortex, and the hippocampus. And then in the immediate postpartum time period when a woman becomes depressed, we think that decreased synaptic plasticity is associated with those changes in the hippocampus and are associated with the development of depressive symptoms.

As we understand the mechanisms underlying postpartum depression, we are going to be able to develop various biomarker tests that will allow us to identify women who are at elevated risk and allow us to intervene early even before onset of symptoms to prevent the

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onset of postpartum depression.

Announcer:
That was Dr. Jennifer Payne discussing the biology behind postpartum depression. To access this and other episodes in our series, visit *Advances in Women's Health* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

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