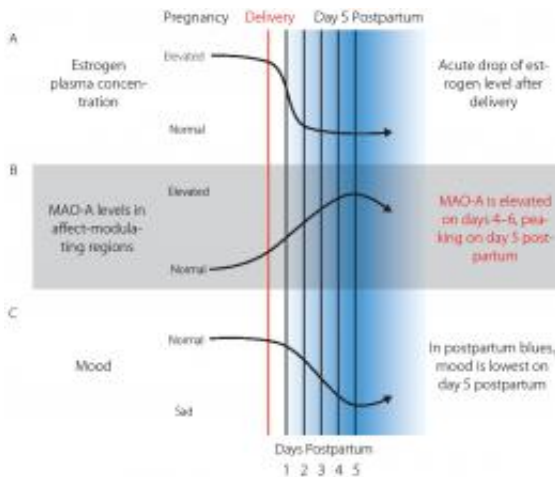


More than just the baby blues

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Monoamine model of postpartum blues. A: After delivery, estrogen levels drop 100- to 1000fold; the estrogen decline is greatest during the first 3 to 4 days postpartum, with a modest decline thereafter. B: Monoamine oxidase A levels are significantly greater in the early postpartum period, with a peak on day 5 postpartum. C: In the early postpartum period, up to 70 percent of mothers experience sadness, mood lability, anxiety, insomnia, poor appetite, and irritability, with mood being lowest on day 5 postpartum. Credit: Image: Max Planck Institute for Human Cognitive and Brain Sciences

Within the first week after giving birth, up to 70 percent of all women experience symptoms of the baby blues. While most women recover quickly, up to 13 percent of all new mothers suffer from symptoms of a clinical-level postpartum depression.

Postpartum depression is defined as a major depressive episode starting within 4 weeks after delivery and is a significant public health problem. Postpartum blues represents a major risk factor for developing [postpartum depression](#) and severe postpartum blues symptoms can be viewed as a prodromal stage for postpartum depression. Julia Sacher from the MPI for Human Cognitive and Brain Sciences in Leipzig and her colleague Jeffrey H. Meyer from the Centre for Addiction and Mental

Health in Toronto, Canada, could now reveal an increase of the enzyme MAO-A throughout the female brain in the immediate postpartum period and propose a novel, neurobiological model for postpartum blues [*Arch. Gen. Psychiatry*, 26 May 2010].

For most women, the birth of their baby is one of the most strenuous but also happiest days in their lives. So it is very difficult to understand why almost three-quarters of all women feel down shortly after giving birth. They can suffer from extreme sadness, [mood swings](#), anxiety, sleeplessness, loss of appetite, and irritability. For a long time, the reasons for this have been unclear. What has been known is that in the first three to four days after giving birth, estrogen levels drop 100 to 1000 fold.

In the current study researchers have discovered that proportional to this estrogen-loss, levels of the enzyme monoamine oxidase A (MAO-A) increase dramatically throughout the female brain. The enzyme can be found in higher concentrations in [glial cells](#) and monoamine-releasing neurons, where it breaks down the neurotransmitters serotonin, dopamine, and norepinephrine. As well as being responsible for transmitting signals between [nerve cells](#), these neurotransmitters also influence our mood. If they are deficient, we initially feel sad, and later have a high risk of becoming depressed.

Using positron emission tomography (PET) - an imaging method that creates images of the distribution of a short-lived radioactive substance in an organism - the researchers measured the distribution of a radioactively- marked ligand in the brain which binds specifically and with a high affinity to the enzyme [monoamine oxidase A](#). They found that levels of MAO-A were, on average, 43 percent higher in women who had just had a baby than in a control group consisting of women who either had children a long time ago or had no children. The MAO-A increase could be shown in all brain regions investigated, with MAO-A levels being highest on day five postpartum. This result

fits neatly with the fact that the mood of mothers often hits a low precisely on this day.

Severe baby blues symptoms can be viewed as a prodromal stage for postpartum depression. From this perspective, preventing depressive symptoms in the immediate postpartum period may have powerful impact for prophylaxis of postpartum depression. Attempts can be made to either lower elevated levels of MAO-A with selected antagonist drugs, or to increase the concentration of monoamine neurotransmitters that can elevate mood. Both have the goal of keeping levels of monoamine neurotransmitters in the brain balanced after birth. Given the need to develop treatments that are compatible with breastfeeding, the intake of dietary supplements of monoamine precursors in the early [postpartum period](#) would be a promising strategy to maintain a sufficient balance of monoamines during this time. This includes the administration of precursor supplements such as the amino acids tryptophan and tyrosine, which the body can convert into the neurotransmitters serotonin, norepinephrine, and dopamine, respectively.

"Our results have the exciting potential for prevention for severe postpartum blues. This could have an impact on prevention and treatment of postpartum depression in the future", says Julia Sacher, first author of the study.

More information: J. Sacher, A. A. Wilson, S. Houle, P. Rusjan, S. Hassan, P. M. Bloomfield, D. E. Stewart, J. H. Meyer, Elevated Brain Monoamine Oxidase A Binding in the Early Postpartum Period, *Archives of General Psychiatry* 67(5):468-474 (2010)

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