

# Postpartum anxiety delays puberty in offspring

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Hormonal changes early in pregnancy cause maternal postpartum anxiety and behavior changes that can lead to a delayed onset of puberty in both birth and adoptive daughters, according to a new study conducted in mice.

Women have an increased rate of anxiety during pregnancy and for 2 years after giving birth, said the study's lead author, Caroline Larsen, PhD, a postdoctoral fellow at the University of Otago in Dunedin, New Zealand.

"Postpartum anxiety disorders are poorly understood and difficult to treat," Larsen said. "There is growing evidence that untreated anxiety disorder during pregnancy may contribute to premature birth and also can have major and lasting adverse effects on the infant's development and behavior."

Prolactin is a hormone that may protect against anxiety. Recently Larsen and her co-workers found that mice with induced low levels of prolactin in early pregnancy displayed substantial [anxiety](#) after they gave birth. Because the researchers also noted that daughters of the anxious mothers had delayed onset of puberty, they conducted the current study to learn what causes this late physical transition to sexual maturation.

Daughters of female mice made anxious by low prolactin were raised either by their birth mother or by a mouse who was not anxious (control mother). Another group consisted of daughters of nonanxious mice, and

these mice were raised by either a control mother or an anxious mother. There were at least six mice in each of the four groups. The researchers determined onset of puberty by examining when the vagina opened and noting the time of first estrus (equivalent to the first menstrual cycle in humans).

"Remarkably, puberty was still delayed even if the daughters of anxious mothers were raised by nonanxious mice," Larsen said. "And delayed puberty also occurred in daughters born to nonanxious mothers who were raised by anxious mothers."

This result demonstrates that hormonal changes in early pregnancy, as well as changes in maternal behavior caused by these hormone changes, can alter brain development in the offspring and delay puberty, she explained. Larsen believes that their work, with further study, may translate to people.

"Finding the hormonal mechanisms that trigger the timing of puberty in mice may help identify potential targets for the prevention and treatment of delayed or early puberty in humans," she said.

Late puberty in humans is linked to shortened height and psychological problems that can persist into adulthood.

Source: The Endocrine Society ([news](#) : [web](#))

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