Good parenting triumphs over prenatal stress

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A mother's nurture may provide powerful protection against risks her baby faces in the womb, according to a new article published online today in the journal *Biological Psychiatry*. The research shows that fetuses exposed to high levels of stress hormone - shown to be a harbinger for babies' poor cognitive development - can escape this fate if their mothers provide them sensitive care during infancy and toddler-hood.

The new study represents the first, direct human evidence that fetuses exposed to elevated levels of the stress hormone cortisol may have trouble paying attention or solving problems later on. But what may be more intriguing is the study's second finding - that this negative link disappears almost entirely if the mother forges a secure connection with her baby.

"Our results shape the argument that fetal exposure to cortisol - which may in part be controlled by the mother's stress level - and early caregiving experience combine to influence a child's neurodevelopment ," said study author Thomas O'Connor, Ph.D., professor of Psychiatry and of Psychology at the University of Rochester Medical Center, and director of the Wynne Center for Family Research. "If future studies confirm these findings, we'll need to not only engineer ways to reduce stress in pregnancy, but we'll need to also promote sensitive caregiving by moms and dads."

A Mother's Love

For the study, researchers recruited 125 women at an amniocentesis clinic in an urban maternity hospital, taking a sample of their amniotic fluid so that stress hormones in it could be measured. The mothers were at 17 weeks gestation on average; only mothers with normal, healthy pregnancies and subsequent deliveries were followed.

When their children reached 17 months of age, researchers administered a Bayley infant developmental scale test, which relies on puzzles, pretend play, and baby "memory" challenges to gauge youngsters' cognitive development. They also observed the baby and mother using the Ainsworth "Strange Situation" test, which judges childrearing quality, categorizing mom-baby
pairs as either showing secure or insecure attachment to each other (to watch a YouTube video of a sample of this sort of test in action, click here).

With cortisol levels, relationship quality results, and cognition scores in hand, researchers analyzed how the first two measures might influence the third. Indeed, for children showing "insecure attachment" to their mothers, a high prenatal cortisol level was linked with shorter attention spans and weaker language and problem-solving skills. But interestingly, for kids who enjoyed secure relationships with their moms, any negative link between high prenatal cortisol exposure and kids' cognitive development was eliminated.

"This is such refreshing news for mothers," O'Connor said. "Pregnancy is an emotional experience for many women, and there is already so much for mothers to be careful of and concerned about. It's a relief to learn that, by being good parents, they might 'buffer' their babies against potential setbacks."

Study Spawns Future Questions

O'Connor goes on to note a couple important nuances of the study. The first is that the amniotic (in-utero) cortisol studied could result from two sources, and it's hard to pinpoint which. It might, for instance, be passed along the placenta from an anxious mother to her unborn baby - or it could be created and excreted directly by a stressed fetus itself.

"While many large-scale studies have observed that prenatal stress may influence child development, our particular study sheds some light on the 'how'," O'Connor said. "Still, much more research is needed to better pinpoint the exact mechanisms behind a mother 'transferring' her stress to her unborn baby."

This study plays into the much larger theory of "fetal programming," which suggests that events in the womb may prime the developing child for long-term health and developmental outcomes. Past studies, for instance, have found a pregnant mother's diet can sway a child's long-term risk for heart disease, diabetes and obesity. Along with diet, prenatal stress has emerged as another large-looming factor in such programming.

"Our results support this emerging theory," said London-based study co-author, Vivette Glover, Ph.D. "In neurology, the idea emerging is that unborn children sense their mothers' stress hormone levels, programming them for greater watchfulness. We're trying to determine whether or not that sensitivity comes with greater anxiety during childhood, and if so, what we can do about it."

The team's next study will revisit these same children when they turn 6; at that point, researchers hope to give the group a battery of more definitive tests to see how the interplay between in-utero cortisol levels and sensitive parenting pans out in the long-term. Those tests would include imaging studies of the children's brains, looking to see if the higher cortisol levels may be linked to anatomical changes.

Provided by University of Rochester Medical Center