

## **The effects of maternal stress and anxiety during pregnancy**

Since ancient times, scientists have written about beliefs that the emotional state of the pregnant mother may affect her unborn child. Today, both animal and human studies support the notion that maternal stress and anxiety during pregnancy can have both immediate and long-term effects on her offspring. However, studies vary substantially in terms of their methodologies and results. Some studies examine isolated stressors, such as death of a spouse or natural disaster, while others look at stressful feelings and daily hassles during pregnancy.

**Prenatal stress and perinatal outcomes**—Maternal stress and anxiety during pregnancy has been associated with:

- shorter gestation & higher incidence of preterm birth
- smaller birth weight and length
- increased risk of miscarriage

**Prenatal stress and infant outcomes**—Prospective studies have shown that maternal stress and anxiety during pregnancy are related to infant outcomes such as:

- temperamental problems and increased fussiness
- problems with attention, attention regulation, and emotional reactivity
- lower scores on measures of mental development

**Prenatal stress and child outcomes**—A recent large-scale epidemiological study confirmed some of the infant outcomes above and showed associations between prenatal stress and anxiety and:

- hyperactivity and inattention in boys
- emotional problems in girls and boys
- conduct problems in girls

**Prenatal stress and adult outcomes**—A number of retrospective and epidemiological studies have linked severe stress during pregnancy (such as experiencing famine, a major earthquake, or other natural disasters) to higher incidences of mental illness in adult offspring, such as schizophrenia and severe depression.

**Moderate stress versus chronic or severe stress**—Some studies have shown that mild to moderate levels of stress during pregnancy might actually be good for the baby, resulting in healthier immune systems and better motor development. More research is needed before firm conclusions can be drawn, but it may be that mild to moderate amounts of stress during pregnancy help prepare the baby for later stressors, such as birth.

**Possible mechanisms**—There are no direct neural pathways between the mother and fetus, so scientists have looked for more indirect pathways to understand how a mother's level of stress

and anxiety may impact her baby. One possible mechanism is through stress hormones. When we are stressed, a series of chemical changes is set off in our bodies and brains, such as the release of cortisol and adrenaline. Normally, these chemicals help prepare us for danger and are important for our survival; however, if we are chronically stressed and anxious, these stress-related hormones can remain high for too long and wreak havoc on our bodies. Stress hormones in the mother's body do reach the baby. When a pregnant woman is chronically stressed or experiences extreme stress, the baby may be exposed to unhealthy levels of stress hormones, which can impact the baby's brain development. Chronic or extreme maternal stress may also cause changes in the blood flow to the baby, making it difficult to carry oxygen and other important nutrients to the baby's developing organs. In addition, chronically or severely stressed mothers may feel overwhelmed and fatigued which might impact their diet and sleep habits and consistency of prenatal care. All of these factors may help explain how maternal stress during pregnancy can have long-term effects on the unborn child.

Importantly, studies are beginning to examine what factors might help buffer the effects of stress during pregnancy. One important factor seems to be the mother's level of social support. Other protective factors may include: gaining some control of stressful situations, consistent prenatal care, regular light exercise, adequate rest, healthy eating habits, and avoiding alcohol, tobacco, and other drugs.

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