

Stressful pregnancies can lead to stressful children

July 22 2011, by Deborah Braconnier



(Medical Xpress) -- A new study published in *Translational Psychiatry* suggests that children whose mothers are highly stressed during pregnancy are more likely to be vulnerable to stress as they grow older.

While the connection between stress during pregnancy and behavioral issues in children is not something new, this new study, led by Helen Gunter, PhD, from the University of Konstanz in Germany, discovered that children whose mothers had been subjected to domestic violence during their pregnancy showed an alteration in a gene that has a direct link to behavioral problems and [stress response](#).

The study examined 25 children and teens age 10 to 19 as well as their

mothers. The mothers received [questionnaires](#) before the study began asking about domestic violence and their pregnancy. Eight of the 25 mothers were victims of domestic violence during their pregnancy.

The researchers then turned their focus to the glucocorticoid receptor (GR) gene and its methylation status in the children. What they discovered was that the children born to mothers under stress during pregnancy had alterations to the GR that left them with an impaired ability to handle stress. Those children born to mothers whose abuse happened before or after, but not during pregnancy, did not show this alteration. This suggests that this high level of stress during pregnancy increases the risk of these [gene alterations](#).

According to interviews with the children, the researchers say this alteration leaves the children more sensitized to stress. They tend to be more impulsive and struggle with their emotions. Gunter now plans on conducting behavioral testing on the children to determine if these alterations have actually affected their [coping skills](#).

This glucocorticoid-receptor gene and altered activity, while linked to stress, has also been linked to an increased risk of obesity, depression, some [autoimmune diseases](#), impulsiveness and [aggression](#).

This study is the first of its kind to show that psychological stressors during the gestational period can create a lasting impact on methylation status in humans.

More information: Transgenerational impact of intimate partner violence on methylation in the promoter of the glucocorticoid receptor, *Translational Psychiatry* (2011) 1, e21; [doi:10.1038/tp.2011.21](https://doi.org/10.1038/tp.2011.21)
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Abstract

Prenatal exposure to maternal stress can have lifelong implications for psychological function, such as behavioral problems and even the development of mental illness. Previous research suggests that this is due to transgenerational epigenetic programming of genes operating in the hypothalamic–pituitary–adrenal axis, such as the glucocorticoid receptor (GR). However, it is not known whether intrauterine exposure to maternal stress affects the epigenetic state of these genes beyond infancy. Here, we analyze the methylation status of the GR gene in mothers and their children, at 10–19 years after birth. We combine these data with a retrospective evaluation of maternal exposure to intimate partner violence (IPV). Methylation of the mother's GR gene was not affected by IPV. For the first time, we show that methylation status of the GR gene of adolescent children is influenced by their mother's experience of IPV during pregnancy. As these sustained epigenetic modifications are established in utero, we consider this to be a plausible mechanism by which prenatal stress may program adult psychosocial function.

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