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The pregnancy relationship and the unborn child: Chronic stress and the epigenetic changes in the brain

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Statement of the problem: Stress initiates a 3 step reaction: 1) The alarm; 2) resistance; 3) exhaustion. If the third step continues, there is the higher risk of long-term damage affecting the endocrine glands perpetuating immune exhaustion resulting in functional deterioration. Chronic stress during pregnancy has been found to have a long-lasting effect on the developing offspring into their adult years. The stress mechanism increases hypothalamic-pituitary-adrenal (HPA) axis output which may cause a loss of placental barrier influencing the fetal physiology changing the regulation of the fetal HPA-axis. A second mechanism is the maternal HPA-axis hormone stimulating the placenta to produce corticotropin-releasing hormone (CRH) that will enter into the fetal circulation. CRH is a marker determining the length of gestation. Increased levels of HPA-axis hormones could possibly affect the developing child's nervous system, primarily, the brain glucocorticoid receptor (GR) development. The GR is expressed in almost every cell and regulates genes that control development, metabolism, and immune reaction. A third mechanism is decreased blood flow to the uterus as a result of increased levels of cortisol and catecholamines in the maternal circulation. According to the HPA axis theory and evidence, stress during pregnancy and during sensitive periods of development can have long-standing changes in the fetus neurodevelopment and behavior. According to Godfrey and Baker, sensitive windows are periods when stress hormones "may alter the development of specific fetal tissues during sensitive periods of development or may lead to long-lasting changes in hormone secretion or tissue hormone sensitivity". Patterns of prenatal stress increase maternal cortisol and may cause a considerable increase in fetal cortisol. Maternal anxiety and stress may be associated with complications in pregnancy and may alter the programming of the fetal neuroendocrine system.

Biography

Laura Hanson, D.C., MHS, D.I.C.C.P., NDT, is a board-certified chiropractic pediatric diplomat, neuro-developmental therapist, and has completed her Master's in Sports Health Science with a concentration in Nutrition. She has held faculty positions at both Palmer College and Life University from 2003 until 2012. She is recognized domestically and internationally through her personal teachings to health care professionals, teachers, and parents on the progression of pediatric development. She has practiced since 1996 in the area of pediatric development and brain-based patient management. she is recognized as a world expert in teaching and caring for children with developmental delay. Her goal is to educate communities on the effects of stress on the developing brain, inability to conceive a baby, meltdowns and parenting, and chronic ill health.

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