Prenatal Stress Effects on Neonatal Health and Infant Reactivity

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A number of recent reports have documented a relation between maternal stress or anxiety during pregnancy with later neonatal and infant outcome measures (e.g., Monk et al., 2000). Although perceptions of stress during pregnancy have been related to poorer birth outcomes and greater neonatal reactivity and irritability (e.g., DaCosta et al., 1998; Field, 1991; Gorshuch & Key, 1974), little work has been conducted to examine the physiological mechanisms that underlie the relation between maternal stress during pregnancy and behaviors of the young infant. Similarly, little research has been conducted to examine the effect of stress on human development or to examine the long-term consequences associated with prenatal stress exposure even though neuroendocrine changes associated with the stress response have been shown to have profound bodily effects. Further, animal studies have shown that prenatal stress exposure is associated with life-long elevations in blood pressure (Hoet & Hanson, 1999) and higher behavioral reactivity to environmental demands (e.g., Roughton et al., 1998; Schneider, 1992). The possibility that prenatal stress exposures may affect vulnerabilities to illnesses or to behavioral phenomena that predispose one to such illnesses has not been shown in humans. This project will prospectively examine the effect of stress exposure during fetal development on neonatal health and later infant behavioral and physiological reactivity in response to challenging tasks. Specifically, this project will examine the effect of maternal stress during pregnancy on birth outcome measures, infant heart rate reactivity to mildly stimulating tasks, infant heart rate at rest, and infant behavioral reactivity to environmental demands. Maternal stress during the third trimester of pregnancy is expected to predict lower birth weight, shorter body length, and smaller head circumference at birth. Further, lower APGAR scores are predicted for neonates born to mothers with high levels of catecholamines during the third trimester. Likewise, higher catecholamine levels during the third trimester of pregnancy are expected to predict greater physiological and behavioral reactivity in the young infant. Furthermore, moderate baseline heart rate and greater heart rate deceleration is predicted in infants who were exposed to moderate levels of catecholamines during prenatal development. High baseline heart rate and heart rate acceleration is predicted in infants who were exposed to high levels of maternal stress during pregnancy. Variables that have been shown to mediate the stress reponses (i.e., social support, marital satisfaction, and depression) are predicted to mediate the mothers' physiological and psychological responses to stressful events during pregnancy.