1269/PRENATAL GLUCOCORTICOID ADMINISTRATION INFLUENCES CHILD HPA AXIS REGULATION

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Due to the rapid developmental changes that occur during the fetal period, prenatal influences can affect the developing central nervous system with lifelong consequences for physical and mental health. One proposed mechanism by which this occurs is via glucocorticoids, which can pass through the blood-brain barrier and target receptors throughout the central nervous system. The synthetic glucocorticoid, betamethasone, is routinely given prenatally to fetuses at risk for being born preterm. Due to imprecision in the diagnosis of preterm labor and clinical interventions, about a third of these babies will be born at term. Few studies have examined the lasting consequences of prenatal exposure to betamethasone on the regulation of the hypothalamic-pituitary-adrenal (HPA) axis in healthy children. The purpose of this study is to examine whether prenatal exposure to betamethasone alters diurnal cortisol in children who were born full term. Unlike endogenous glucocorticoids, betamethasone readily passes the placental barrier and thereby provides a more direct test of glucocorticoid exposure. Children (mean age of 8 years) were separated into two groups: children prenatally treated with betamethasone (n=18) and children naïve to prenatal synthetic glucocorticoids (n=61). To measure the circadian release of cortisol, multiple salivary samples were collected on a single day in the child's home, including: at time of awakening; 30, 45, and 60 minutes after awakening; and in the evening. Children naïve to prenatal synthetic glucocorticoids showed a typical diurnal cortisol pattern that peaked in the morning (the cortisol awakening response) and gradually decreased throughout the day. Multilevel modeling revealed that even after accounting for covariates, children exposed to prenatal betamethasone had a blunted cortisol awakening response and diurnal slope compared to controls (p's <0.01). These data suggest that prenatal exposure to synthetic glucocorticoids disrupts the circadian regulation of the HPA axis among children born at term. As disrupted circadian regulation of cortisol has been linked to a variety of health problems, future research is needed to determine whether children exposed to prenatal synthetic glucocorticoids are at risk for poor mental and physical health.