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- 52 **ATTENUATION OF THE CORTISOL AWAKENING RESPONSE (CAR) OVER THE COURSE OF HUMAN GESTATION IS ASSOCIATED WITH GESTATIONAL AGE AT BIRTH** CLAUDIA BUSS<sup>1</sup>, SONJA ENTRINGER<sup>1</sup>, ALISON L. CAMMACK<sup>1</sup>, JONAZARY F. REYES<sup>1</sup>, ALEKSANDRA CHICZ-DEMET<sup>1</sup>, CURT A. SANDMAN<sup>1</sup>, PATHIK D. WADHWA<sup>1</sup>, <sup>1</sup>University of California, Irvine, Irvine, California. Supported in part by US PHS (NIH) Grants HD-33506 and HD-041696 to PDW

**OBJECTIVE:** The state of pregnancy produces physiological alterations in the maternal compartment, including increased cortisol secretion and altered stress responsiveness. The nature of these changes is progressive over the course of gestation. The magnitude of change in psychological stress perception over gestation has been associated with adverse birth outcomes. However, to date no studies have addressed the association between physiological stress responsiveness and intra-individual changes in physiological stress responsiveness over gestation with birth outcomes.

**STUDY DESIGN:** Using a longitudinal prospective design, we assessed pregnancy-related changes in the cortisol awakening response (CAR) as a measure of hypothalamus-pituitary-adrenal (HPA) axis responsiveness. The CAR was assessed repeatedly in 101 pregnant women at  $16.8 \pm 1.4$  and  $31.4 \pm 1.3$  weeks' gestation. At each assessment, saliva samples were collected at 7 times--immediately, 30, 45 and 60 min post awakening as well as at 12:00 pm, 4:00 pm and 8:00 pm. The association was tested between the CAR, modeled in reference to the individual diurnal cortisol slope, in early and late pregnancy, as well as the change in the CAR from early to late gestation, and gestational age at birth.

**RESULTS:** Hierarchical linear model (HLM) analyses revealed significantly higher cortisol concentrations in late compared to early pregnancy ( $p < 0.01$ ). In late pregnancy, the increase to awakening was dampened, reflected by significantly lower cortisol increase post awakening ( $p < 0.01$ ). Shorter gestational length was significantly associated with higher cortisol concentrations post awakening ( $p < 0.05$ ) as well as with less attenuation of the CAR from early to late gestation ( $p < 0.05$ ).

**CONCLUSION:** These findings suggest there are systematic changes in the CAR during pregnancy, characterized by progressively increasing baseline levels and reduced reactivity in response to awakening over the course of gestation. Moreover, the findings suggest the cortisol concentrations during the first hour after awakening as well as the degree of attenuation of the CAR over the course of gestation may be markers of pregnancy duration.

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