

Paper Session A3: Methods and Measures in Nursing Research: Recent Innovative Advances

Developmental Origins Theory and HPA Axis Function in Formerly Preterm Infants at Age 23

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Purpose: One in eight babies, or more than 500,000 per year, are born prematurely and there is increasing recognition of the long-term health and neurodevelopmental consequences. The purpose is to examine alternations in hypothalamic-pituitary-adrenal (HPA) function in four typical cases of preterm and full term infants at young adulthood.

Theoretical Framework: The Developmental Origins Theory proposes that prenatal and perinatal stress provokes adaptive changes in endocrine and metabolic processes that become permanently programmed and impact later adult health. The HPA axis is highly susceptible to persistent stress with long lasting consequences. Cortisol is a glucocorticoid essential for regulation and support of metabolism, immune response, vascular tone, and general homeostasis.

Method: We profile four typical cases from a longitudinal study of infants at age 23. Infants were born full-term or preterm with medical and neurological perinatal morbidities. Five diurnal salivary samples were collected in timed intervals during a typical weekday. Eight salivary samples were collected during a standard social stress paradigm, the Trier Social Stress Test (TSST). Highly valid and reliable enzyme immunoassay analyses were conducted in duplicate by Salimetrics. Diurnal and TSST cortisol values are plotted by neonatal risk.

Results: Diurnal and stress reactivity plots for the full term subject illustrate normal neuroendocrine activity. In contrast, preterm subjects who had high neonatal risk demonstrated high morning cortisol levels and little day-long decline in diurnal levels. Cortisol patterns in the TSST showed blunting or flat reactivity to social stress.

Conclusions and Implications: HPA dysregulation has been reported in infants and toddlers as well as in older adults born prematurely. Early identification of HPA function at young adulthood provides evidence in support of the Developmental Origins Theory and early identification of those at risk for later metabolic or vascular disease. Supported by NIH RO1 NICHD 19195; RO1 NR 003695