

Program Number: 426.18

Day / Time: Monday, Oct. 25, 9:00 AM - 10:00 AM

Evaluating the status of the hypothalamic pituitary adrenal (HPA) axis after challenge: The salivary cortisol response in a pilot study of police officers

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Surveys identify stress as a concern of workers and stress is considered to have negative health effects. The subjectivity of surveys may impede an understanding of how stress can compromise health. Thus, a biological assessment of stress in epidemiological studies of worker health is a crucial step in linking stress to disease. As compromised HPA axis activity is linked to disease we are investigating the use of salivary cortisol as a biomarker of stress in human populations. We conducted a pilot study using this measure in preparation for a large population-based study of stress and health in police, a population with high workplace stress. We determined if subjects were reliable in collecting samples and if standard provocations resulted in the expected cortisol change. Male and female (n= 58, 42, respectively) officers were recruited in Buffalo, NY and provided informed consent. Saliva was collected at specific times following several provocations including: (1) awakening (2) time of day (3) a high protein drink (4) awakening following a bedtime dosage of 0.5 mg dexamethasone (DEX). Compliance was good and collected samples were sufficient to evaluate the efficiency of each challenge. Cortisol exhibited the expected diurnal pattern as evidenced by the negative slope of the morning, noon and evening samples in 89% of the subjects. The awakening and the high protein challenge elevated cortisol in 75% and 77% of the subjects, respectively. DEX suppressed cortisol as evidenced by the median value at awakening after bedtime DEX (1.5 nmol/L; 0.7,3.8 interquartile range [IQR]) compared to standard awakening values (11.1 nmol/L; 7.3,18.0 IQR). Salivary unbound cortisol can serve as a population-based biological indicator of stress and in conjunction with questionnaires may serve to link stress and disease outcomes.

Citation: D.B.Miller, C.Burchfiel, M.Hammer, M.E.Andrew, C.M.Beighley, D.S.Sharp, K.R.Pierino, J.M.Violanti. Evaluating the status of the hypothalamic pituitary adrenal (HPA) axis after challenge: The salivary cortisol response in a pilot study of police officers. Program No. 426.18. 2004 *Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience

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