

Klein, L.C., Bennett, J.M., Whetzel, C.A., & Ritter, F.E. (2008). *Daily caffeine use impacts neuroendocrine and cardiovascular responses to laboratory stress in healthy men*. Presented at the annual meeting of the American Psychosomatic Society, Baltimore, MD. *Psychosomatic Medicine*, 70(3), A-58.

Daily Caffeine Use Impacts Neuroendocrine and Cardiovascular Responses to Laboratory Stress in Health Young Men

Laura Cousino Klein, Jeanette M. Bennett, Courtney A. Whetzel, Department of Biobehavioral Health, Frank E. Ritter, College of Information Sciences and Technology, Penn State University

The impact of daily caffeine consumption on cardiovascular and neuroendocrine responses to laboratory stress and caffeine administration was examined in 45 healthy, young men (18-30 yrs old). Participants were daily caffeine consumers, were not using nicotine products or any medications, and did not have health conditions that would affect the dependent measures. Participants arrived at the lab at 1 PM where they were administered one of three doses of caffeine: none (placebo), 200 mg caffeine (LOW; about 1-2, 8oz cups of coffee), or 400 mg caffeine (MOD; about to 3-4, 8oz cups of coffee). Next, participants were administered a 25 min serial subtraction stressor. Blood pressure and heart rate were collected throughout the study; saliva was collected before and 15-min after the stressor to determine cortisol, dehydroepiandrosterone-sulfate (DHEA-S), and alpha amylase responses to the challenge. Daily caffeine use was verified by salivary caffeine levels (ng/mL) taken at the beginning of the study, prior to drug and stressor administration, and by self-report (mg caffeine/day). Self-reported daily caffeine intake and baseline caffeine levels were not correlated ($R=+0.04$). Linear regression models indicated that baseline salivary caffeine levels did not impact baseline cardiovascular or neuroendocrine levels prior to caffeine or stressor administration. In contrast, however, self-reported daily caffeine use significantly predicted baseline heart rate and salivary alpha amylase, a surrogate biomarker of sympathetic activation ($R_s > +0.29$, $P_s < 0.05$). With regard to stress reactivity, laboratory administered caffeine (as indexed by salivary caffeine levels) was an important predictor of neuroendocrine (i.e., cortisol, DHEA-S, alpha amylase) but not cardiovascular (i.e., blood pressure, heart rate) responses to stress for all participants ($R_s > +0.38$, $P_s < 0.05$). Baseline caffeine levels and self-reported daily caffeine use were not important predictors of neuroendocrine or cardiovascular reactivity to stress. Many laboratory stress studies do not measure daily caffeine intake in participants. These data are important because they suggest that daily caffeine intake can alter baseline physiological measures.