Salivary Cortisol among American Indians with and without Posttraumatic Stress Disorder (PTSD): Gender and Alcohol Influences

Mark L. Laudenslager; Carolyn Noonan; Clemma Jacobsen; Jack Goldberg; Dedra Buchwald; J. Douglas Bremner; Viola Vaccarino; Spero M. Manson

Abstract

Disruptions in hypothalamic–pituitary–adrenal regulation and immunity have been associated with posttraumatic stress disorder (PTSD). We examined the association of PTSD with diurnal rhythms in salivary cortisol in a convenience sample from a population-based study of male and female American Indians. Subjects with and without PTSD were identified from American Indians living on/near a Northern Plains reservation as part of a larger study. Over two days diurnal saliva samples were collected by staff at the University of Colorado Denver Clinical Research Center at waking, 30 min after waking, before lunch, and before dinner. Generalized estimating equations linear regression models investigated the influence of PTSD on cortisol over time. The association of a lifetime diagnosis of PTSD with salivary cortisol level was assessed in subjects with complete data (PTSD: n = 27; no PTSD n = 32) for age, gender, and alcohol consumption in the past month. Subject mean age was 44 years, and 71% were women. When stratified by gender, women with a lifetime diagnosis of PTSD had significantly higher mean cortisol levels throughout the day than women without PTSD (p = 0.01); but there was no significant association between PTSD and cortisol levels in men (p = 0.36). The cortisol awakening response – the difference in cortisol levels from waking to 30 min after waking – was not associated with PTSD in men or women. A lifetime diagnosis of PTSD may influence diurnal cortisol among American Indian women. These effects were independent of influences of current alcohol use/abuse. The unexpected elevation in cortisol in American Indian women with a lifetime diagnosis of PTSD may reflect acute anxiety associated with experiencing a number of novel tests in a strange location (e.g., cardiac imaging, medical, dental exams, etc.), or concurrent depression.