Abstract 40

Neuroendocrine, Inflammatory, and Immune Biomarkers Associated With Body Composition, Depression, and Cognitive Impairment in Elderly Men and Women

Jean P. Roux, PhD;[1] Kenna Stephenson, MD;[1] Sanjay Kapur, PhD;[2] David Zava, PhD;[2] Robert Haussman, PhD;[1] Christine Gély-Nargeot;[3] and Courtney Townsend[4]

[1]Northcentral University, Prescott, AZ; [2]ZRT Lab, Beaverton, OR; [3]University of Montpellier III, Montpellier, France; and [4]University of Texas Health Science Center, Tyler, TX

Introduction: By 2030, it is estimated that 20% of the US population will be over 65 years of age and that 75% of adults will have one or more severe disabilities by age 80. Cardiovascular disease, depression, and dementia are significant concerns in our aging global population. Determining preventive models for age-related diseases, frailty, and functional decline is critical. Dysregulation of inflammatory pathways and steroid hormonal axes have been identified in age-related diseases including mood disorders, dementia, and cardiovascular disease.

Methodology: In this correlational study, 156 men and women 60 years of age and older who met strict inclusion/exclusion criteria underwent evaluation with the Patient Health Questionnaire (PHQ)-2, PHQ-9, Geriatric Depression Scale (GDS), Folstein Mini-Mental Status Exam (MMSE), and Clock Drawing Test (CDT). Subjects underwent waist circumference measurement, along with whole blood sampling for C-reactive protein (CRP), insulin-like growth factor (IGF)-1, progesterone, estradiol, and testosterone levels. Saliva samples were collected for analyses of cortisol circadian rhythm, estradiol, progesterone, testosterone, and dehydroepiandrosterone sulfate (DHEA-S). Mean age of participants was 73.99 (SD, 9.63) years with 62.9% female 37.1% male. Educational level completion was high school or higher, and ethnicity was 93.7% Caucasian.

Results: For elderly males the study found significant relationships between age and cognition as measured by the MMSE ($r = -.28$, $P < .05$) and CDT ($r = .27$, $P < .05$) and between increased nocturnal cortisol levels and impaired cognition as measured by the CDT. Male data revealed a significant relationship between low levels of DHEA-S and between higher estradiol levels correlated with depressive disorder ($r = .36$, $P < .05$) as measured by the GDS-30. No significant relationships were found between cognition (as measured by the MMSE and CDT) and depressive mood (as measured by the GDS-30) with C-reactive protein, insulin-like growth factor-1, testosterone, progesterone, and waist circumference in male subjects. In female subjects, age was significantly associated with depressed mood as measured by the GDS-30 ($r = .30$, $P < .01$). Cognition in females as measured by the CDT was significantly associated with increasing age ($r = .42$, $P < .01$), awakening cortisol ($r = .45$, $P < .05$), nocturnal cortisol, cortisol amplitude, DHEA-S, estradiol ($r = .35$, $P < .01$), and CRP levels. MMSE scores in females were significantly associated with increasing age ($r = -.50$, $P < .01$), awakening cortisol ($r = -.57$, $P < .05$), nocturnal cortisol ($r = -.63$, $P < .01$), and cortisol amplitude. Waist circumference, IGF-1, progesterone, and testosterone in female subjects did not significantly impact cognition or mood in female subjects. Demographic factors revealed significant associations of improved mood and cognition in married subjects, subjects residing in an independent living facility, and nutritional supplement use in female subjects.

Conclusion: These data suggest that preventive counseling models in younger adults may be expanded to assess nontraditional clinical markers of neuroendocrine and immune function that are associated with inflammatory pathways in efforts to prevent later age-related cardiovascular disease, depression, and cognitive decline.