craving and predictors of risk for smoking relapse. Our findings point to the importance of examining the links of these hormones with changes in withdrawal severity and mood, appetite, and weight post-cessation.

Abstract 406

THE CORTISOL AWAKENING RESPONSE: WHY TOLERABLE ERRORS IN TIMING MAY NOT BE SO TOLERABLE AND WHY LINEARITY OF CORTISOL RISE SHOULD NOT BE ASSUMED.

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Research linking the Cortisol Awakening Response (CAR) to psychosocial and health domains needs CAR measures to be based on accurately timed saliva samples. How accurate? Typically a CAR is big and brief, and even quite modest delays between awakening and initial saliva sample might theoretically be expected to compromise accuracy; but delays up to 15 min reportedly do not do so. This paradox is explored and predictions examined in new data for effects of moderate delays (5-15 min) on several different CAR magnitude measures, and on timing of the CAR peak. Both self-reported awakening and sampling times were objectively checked by actigraphy and track caps. 50 healthy females (21±4 years) were told to collect saliva on 4 days at 0, 15, 30 and 45 min post-awakening. Self-reports were significantly later by 8 (±11) min than objective estimates of awakening. Self-reported sampling time intervals were accurate (< 2 min mean error). Minimally delayed data (< 5 min) were compared with moderately delayed (5-15 min). CAR magnitude was significantly greater for delayed data and peaked earlier. Plots of cortisol values in real time suggested effects were due to a time lag between awakening and start of cortisol rise; cortisol rise was not linear. Further evidence for this was sought and found in an intensive investigation of 10 participants who collected saliva every 5 min from 0-30 min post-awakening. We conclude that moderate delays in saliva sampling previously thought tolerable lead to errors in estimating CAR magnitude and peak-timing, due to an approximate 10 min lag between awakening and cortisol rise. Ignoring this lag in calculations leads to overestimation of CAR magnitude, even if sampling is only moderately delayed. These findings, if generalizable, clarify how the physiology of the CAR unfolds, but are methodologically challenging for researchers since self-reported awakening times are not accurate enough to override concerns raised. Objective measurement of sampling time would, however, permit known delays to be taken into account when computing CAR estimates.

Abstract 483

ARE HIGH LEVELS OF DEHYDROEPIANDROSTERONE (DHEA) NECESSARY FOR OLD PEOPLE TO MAINTAIN COGNITIVE AND MENTAL HEALTH? FINDINGS FROM THE KORA-AGE STUDY.

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Background: Dehydroepiandrosterone (DHEA) is secreted by the zona reticularis of the adrenal cortex and is converted into potent sex steroids in peripheral target cells. However, randomized trials in elderly subjects with an age-dependent decrease in DHEA have provided no evidence for enhanced mental and physical performance after long-term administration of DHEA. Thus, the widely perceived performance-enhancing activity of DHEA is still more myth than reality. However, there is evidence that low DHEA serum levels - mainly in relation to insulin-like growth factor 1 (IGF-1) - may be associated with impairments in mental health and cognitive functioning. Study aim: We sought to correlate dehydroepiandrosterone-sulfate (DHEA-s) and insulin-like growth factor 1 (IGF-1) serum levels with cognitive and mental health conditions in older subjects from a population-based setting. Data were derived from the KORA-AGE Study conducted in approximately 5,000 older people (≥ 65 years) in Augsburg, southern Germany. A clinical investigation was performed in a random subsample of > 1,000 participants. Study design: Cross-sectional analyses of dehydro-epiandrosterone-sulfate (DHEA-s) and insulin-like growth factor 1 (IGF-1) serum levels were performed in participants of the medical examination of KORA Age (n=1,079 age 64-94) and associations with cognitive and mental health status were examined. Results: Both IGF-1 and DHEAs levels diminish with age. Significant sex differences were observed in both DHEAs (levels were higher in men compared to women in participants 85 and under, $p<0.0001$) and IGF-1 (levels were higher in men age 64-69, $p<0.01$, and age 70-79, $p<0.005$). Low DHEAs (1st quartile) were associated with impaired cognition ($p=0.0043$), Parkinson's symptoms ($p<0.0001$) and depression ($p=0.012$). Physical activity in older participants was significantly associated with increased levels of both IGF-1 ($p=0.0034$) and DHEAs ($p=0.0006$). Conclusion: Age related decreases in the anabolic hormones DHEAs and IGF-1 are related to diminished cognitive and mental health in the elderly population.