The Cortisol/DHEA ratio: A potential biomarker of depression and cardiovascular risk in patients after a cardiac event

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Depression has been identified as a major risk factor for morbidity and mortality following a cardiac event, and is associated with elevated cortisol (a corticosteroid released in response to stress) and lower dehydroepiandrosterone (DHEA - a steroid hormone) levels. DHEA has been proposed to protect against the harmful effects of cortisol, and higher cortisol/DHEA ratios are hypothesized biomarkers of stress and illness. The purpose of this pilot study was to examine the effects of depression, cortisol, DHEA and cortisol/DHEA ratios on increased cardiovascular risk and major adverse cardiac events (MACE- myocardial infarction, target vessel revascularization and death) in patients 12 months after a cardiac event. A convenience sample of 35 patients (25 men and 10 women) ages 44-86 were enrolled. Baseline (within 3 months of a cardiac event) depressive symptoms were assessed by self-report with the Center for Epidemiologic Studies Depression Scale (CES-D Scale). Similarly, baseline salivary cortisol and DHEA levels were collected for two consecutive days at waking (AM) and 12 hours later (PM) and averaged separately for each time point. Systolic and diastolic blood pressure (SBP/DBP) and MACE were assessed from participant medical records. Pearson correlation analysis revealed a positive association between cortisol/DHEA AM ratios ($r=.45$, $p<.01$) and PM ratios ($r=.50$, $p<.01$) and increased SBP at 12 months. Controlling for age, gender, and medication use, hierarchical regression analysis indicated higher baseline CES-D scores were marginally associated with increased SBP ($\beta=.30$, $p=.07$) and significantly associated with increased DBP ($\beta=.38$, $p<.05$) at 12 months. Higher cortisol/DHEA PM ratios were also associated with increased SBP ($\beta=.34$, $p<.05$) at 12 months. No significant associations among CES-D scale scores, cortisol/DHEA ratios and MACE were observed. The findings of this pilot study suggest that higher levels of depressive symptoms and higher cortisol/DHEA ratios may predict increased blood pressure in patients 12 months after a cardiac event. However, interpretation is limited by the small sample size. A larger, longer term study is warranted to evaluate the cortisol/DHEA ratio as a biomarker of cardiovascular risk and depression.