Sitting Time Predicts Cortisol Levels in Women, Independent of Cardiorespiratory Fitness Level

PURPOSE: Research suggests that sitting time may be an independent predictor of negative health outcomes, even after accounting for physical activity (PA) participation. There is limited investigation of the association between sitting time and mental health outcomes, and the mechanisms by which sitting time may increase the risk for mental health disorders are not completely understood. Considering that cortisol [an index of hypothalamic pituitary adrenal (HPA) axis regulation] has been shown to be a robust predictive biomarker for depression and anxiety disorder risk, this study aimed to investigate whether sitting time was associated with salivary cortisol levels in women, and whether this relationship remained significant after controlling for indices of physical fitness. **METHODS:** Twenty-one healthy women [18-45y, mean age: 23.9 +/- 6.3y; mean body mass index (BMI): 23.9 +/- 4.6] who were medication-free and had regular menstrual cycles completed (1) self-report of weekly PA and weekly sitting time; (2) assessment of cardiorespiratory fitness (CRF) via maximal oxygen consumption during exercise; (3) one-week recording of sleep and activity patterns by wrist actigraphy; and (4) measurement of salivary cortisol levels (collected during the follicular phase of the ovarian cycle in order to control for the influence of ovarian cycle hormone fluctuations on salivary cortisol). **RESULTS:** Regression analysis revealed that greater total sitting time/week significantly predicted higher cortisol levels in women (ß= 0.71, $p< 0.001$), and this relationship remained significant after controlling for age, BMI, and CRF level (ß= 0.67, $p< 0.01$). Additionally, greater total sitting time/week was significantly associated with lower actigraph-measured PA (activity counts/min; $r = -.57$ $p < 0.01$). **CONCLUSIONS:** Results suggest that, although greater total sitting time was associated with a reduced amount of daily PA, greater total sitting time may still predict higher salivary cortisol levels, independent of indices of fitness (BMI and CRF). It is possible that the stress-related mechanisms underlying the relationship between sitting time and depression and anxiety risk may be related to sitting time itself, and not a simply a product of reduced daily PA. Further investigation is needed to explore these associations.