*TACSM Abstract*

# Impact of Menstrual Phases on Stress Markers: A Pilot Study

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ABSTRACT

**PURPOSE**: Previous research has shown that different phases of the menstrual cycle may impact biometrics such as markers of stress and inflammation [e.g., cortisol (CORT), interleukin-6] as well as body composition. However, there is scarce literature regarding markers of stress and oxidative stress such as salivary α-amylase (sAA), immunoglobin-A (SIgA) and uric acid (UA), in relation to the four different menstrual phases. The purpose of this study was to examine the impact of menstrual phases on sAA, CORT, UA and SIgA. **METHODS**: 21 pre-menopausal women with regular menstrual cycles ($n$=9) oral contraceptive users (OC) and ($n$=12) non-oral contraceptive users (non-OC) recorded baseline cycle dates using the Flo Period Tracker app™. Participants began experimental testing after recording baseline dates, consisting of four total sessions with one session occurring during the 1) menses, 2) late follicular, 3) ovulatory and 4) late luteal phase. Salivary markers: CORT, sAA, UA, and SIgA, along with diastolic and systolic blood pressure (BP), total body water (TBW) and body fat percentage (BF%) were recorded during each phase. BF% and TBW were determined via InBody bioelectric-impedance analyzer™. 500uL of saliva was collected, with samples immediately frozen at -80°C until analysis. Saliva samples were centrifuged at 4°C for a duration of 15 minutes at 1500g prior to analysis and duplicated for CORT, sAA, UA and SIgA concentrations. Statistical procedures were conducted via SAS v 9.4 (Cary, NC). One way repeated measures analysis of variance was used to evaluate outcome measures as well as changes in salivary markers and body composition measurements across different menstrual cycle phases. Fisher's Least Significant Difference test was used to compare means in the instance of a significant main effect ($p < 0.05$). Partial eta squared ($\eta_p^2$) was run to determine effect size. **RESULTS**: sAA concentrations were significantly lower during the follicular phase compared menstruation phase ($p = 0.006$, $\eta_p^2 = 0.14$). The main effect for SIgA approached significance ($p = 0.05$). There were no changes in CORT, UA, BF%, TBW or diastolic and systolic blood pressure. **CONCLUSION**: These findings suggest the menstrual cycle influences sAA concentrations in both OC users and non-OC users. More research needs to be conducted with a larger sample size in order to determine significance of SIgA in relation to menstrual phases.