TACSM Abstract

Heart Rate Variability Spectral Parameters across the Menstrual Cycle

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ABSTRACT

Heart rate variability (HRV) is a measure of autonomic nervous system function. Absolute low frequency (LF) and high frequency (HF) and the ratio of these components (LH/HF) are used as measures of HRV. Gonadotropin hormones may affect autonomic nervous system function; however, no difference in HRV across the menstrual cycle has been found while participants were in a supine position and breathing spontaneously. The purpose of this study was to investigate different heart rate variability power spectral components across the menstrual cycle while participants were seated and breathing spontaneously. **Method:** Five women volunteered for this experiment. A month prior to testing, they measured basal body temperature daily to map the timing of the menstrual cycle phases. Participants were tested once in each cycle phase. A three lead electrode arrangement recorded electrocardiographic data, sampled at 1000 Hz. A piezoelectric force transducer was placed around the participant's chest to concurrently record breathing rate. The test consisted of a 15 minute rest period at an upright seated position. Following the rest period, 5 minutes of ECG activity was recorded while the participant remained in a seated position and breathed spontaneously. A power spectral density analysis was performed on the R-R interval variations by the fast Fourier transformation method using ECGlab. The spectrum was reduced to absolute and normalized LF, HF and LH/HF. **Results:** There were no significant differences in the absolute LF ($p=0.7944$), normalized LF ($p=0.4449$), absolute HF ($p=0.4805$), normalized HF ($p=0.3994$), or the LF/HF ratio ($p=0.6315$) across the five phases of the menstrual cycle. The breathing rate also showed no significant differences ($p=0.2116$). **Conclusions:** HRV did not change across the cycle when collected in a seated position. However, slow breathing rates (<10 breaths per minute) can increase low frequency power. Participant breathing rate for this study ranged from 6.6 - 23.6 breaths per minute. It is possible that the slow breathing rates caused a false increase in LF and LF/HF ratio. While confirming previous reports of HRV changes across the menstrual cycle, follow-up research should investigate seated HRV changes across the menstrual cycle in a controlled breathing condition.

TEXAS CHAPTER
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