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Sex Differences in Estimating Cardiac Autonomic Function Using Heart Rate Variability: Effects of Oral Capsaicin

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Heart rate variability (HRV) estimates autonomic nervous system (ANS) influence on the heart and is sex-specific. Sensory afferents exhibit sex-specificity; although, there is a paucity of data on the potential effects of Capsaicin, an agonist for transient receptor potential vanilloid channel-1 ($TRPV_1$), on cardiac ANS activity and if the effect is sex-dependent. **PURPOSE**: Therefore, this study sought to determine the sex-specificity in the effect of capsaicin on cardiac autonomic function estimated through HRV. **METHODS**: HRV was measured in 38 young males (M: n=25) and females (F: n=13), and, in a blinded crossover design, after acute ingestion of placebo or capsaicin capsules. Resting measurements of HR, RR interval, root mean square of successive differences (RMSSD), natural log-transformed RMSSD (LnRMSSD), standard deviation of n-n intervals (SDNN), number of pairs of successive n-n intervals that differ by more than 50 msec (NN50), and percent NN50 to total n-n intervals (PNN50) were obtained. **RESULTS**: Under placebo, males had significantly lower minimum HR (M: 49±9.7 vs. F: 58±16 beats/min, p=0.038, d=-0.738) and significantly higher NN50 (M: 141±118 vs. F: 33±23, p=0.003, d=-0.129) than females. There was a main effect of sex on HR (M: 59±9.3 vs. F: 65±12 beats/min, p=0.036, η^2=0.098), minimum HR (M: 47±8.3 vs. F: 56±12 beats/min, p=0.014, η^2=0.124), and NN50 (M: 177±143 vs. F: 29±17, p<0.001, η^2=0.249). There was a significant interaction of sex and treatment (p=0.02, η^2=0.027) for RMSSD, where males increased (Placebo: 78±55 vs. Capsaicin: 91±64 ms), and females decreased (Placebo: 105±83 vs. Capsaicin 76±43 ms). **CONCLUSION**: This study recapitulates previously documented sex differences in HR and HRV. Acute ingestion of capsaicin increased RMSSD in men, but decreased RMSSD in women, suggesting a sexual dimorphism in parasympathetic response, perhaps due to differences in TRPV1-sensitive afferents or sensitivity.