**Discordant neurohumoral responsiveness to orthostatic stress in amenorrheic physically active premenopausal women**

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In light of the known modulatory effects of estrogen on neurohumoral control of blood pressure (BP), we tested the hypothesis that muscle sympathetic nerve activity (MSNA) and serum renin angiotensin aldosterone system (RAAS) levels would differ between estrogen deficient physically active women with functional hypothalamic amenorrhea (ExFHA) and eumenorrheic estrogen replete women.MSNA, serum RAAS components (renin, angiotensin II and aldosterone), and brachial artery BP (mmHg) were recorded at baseline and during graded lower body negative pressure (LBNP; -10, -20, and -40mmHg) in 17 recreationally active eumenorrheic women (ExOv; 24±1 years; body mass index 20.9±0.5kg/m2; mean±SEM) and 12 ExFHA women (25±1 years; 20.7±0.7 kg/m2). At baseline, heart rate (HR; b/min) and systolic BP (SBP) were lower (*p*<0.05) in ExFHA (47±2 and 94±2, respectively) compared with ExOv (56±2 and 105±2) women. Baseline MSNA, RAAS components, and mean arterial BP (MAP) were similar (*p*>0.05) between the groups. In response to graded LBNP, HR was increased (*p*<0.05) and SBP decreased (*p*<0.05) in both groups, but responses were lower (*p*<0.05) in ExFHA women. MSNA (bursts/100 heart beats) increased in both groups, but responses were greater (*p*<0.05) in ExFHA than ExOv women at -20 and -40 mmHg (37±4 vs. 22±4; 45±4 vs. 33±4, respectively). LBNP elicited increases (*p*<0.05) in all RAAS components in ExOv, but not ExFHA, women (*p*>0.05). In conclusion, these findings suggest that in hypoestrogenic ExFHA women, sympathetic nerve activity, but not the RAAS, defends arterial BP during orthostatic stress.

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