Elevated cardiac vagal tone in hypoestrogenic active premenopausal women with functional hypothalamic amenorrhea

This item was submitted to Loughborough University's Institutional Repository by the/an author.

Citation: O’DONNELL, E. ... et al., 2015. Elevated cardiac vagal tone in hypoestrogenic active premenopausal women with functional hypothalamic amenorrhea. FASEB Journal, 29 (1), Supplement 820.7

Additional Information:

- This is an extended abstract published in the FASEB Journal.

Metadata Record: https://dspace.lboro.ac.uk/2134/20611

Version: Accepted for publication

Publisher: © Federation of American Societies for Experimental Biology

Rights: This work is made available according to the conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) licence. Full details of this licence are available at: https://creativecommons.org/licenses/by-nc-nd/4.0/

Please cite the published version.
Elevated Cardiac Vagal Tone in Hypoestrogenic Active Premenopausal Women with Functional Hypothalamic Amenorrhea

Emma O’Donnell1, Jack M Goodman1,2, Beverly L Morris3, John S Floras2,3, and Paula J Harvey4

1Cardiovascular Research Laboratory, Department of Exercise Sciences, University of Toronto, Toronto, Ontario, Canada, and Division of Cardiology at the 2Mount Sinai Hospital, 3Toronto General Hospital, and 4Women’s College Hospital, University of Toronto, Ontario, Canada.

Compared with eumenorrheic women, exercise-trained women with functional hypothalamic amenorrhea (ExFHA) have a low heart rate (HR), absent reflex activation of their renin-angiotensin-system, and augmentation of the normal increase in muscle sympathetic nerve burst incidence during orthostatic stress, suggesting concurrently altered autonomic HR modulation. To test this hypothesis, three age-matched (pooled mean, 24±1 years; mean±SEM) groups of women were studied: ExFHA (n=11), exercise-trained and eumenorrheic (ExOv; n=17), and sedentary and eumenorrheic (SedOv; n=17). Blood pressure (BP), HR, and HR variability (HRV) in the frequency domain were measured at supine rest and during simulated orthostatic stress induced by graded lower body negative pressure (LBNP; -10, -20, and -40mmHg). Very low (VLF), low (LF) and high (HF) frequency power spectra (ms2) were determined, and due to skewness, were log10 transformed. LF/HF ratio and Total power (VLF+LF+HF) were calculated. At baseline, HR and systolic BP were lower (p<0.05), and HF and Total power higher (p<0.05) in ExFHA than eumenorrheic women. In all groups, LBNP decreased (p<0.05) systolic BP, HF and Total power, and increased (p<0.05) HR, and LF/HF ratio. However, in ExFHA, HF and Total power remained higher (p<0.05), and HR, systolic BP
and LF/HF ratio lower \((p<0.05)\) than in eumenorrheic women, in whom measures did not differ \((p>0.05)\). In conclusion, ExFHA women demonstrate augmented vagal HR modulation, whereas sympathetic HR modulation is unchanged, both at rest and during orthostatic stress. Less central angiotensin II may play a role.

Abstract Sponsor: Dr. John S Floras

Sponsor email: jfloras@mtsinai.on.ca

Sponsor telephone number: 416-586-8704