https://doi.org/10.6063/motricidade.31774

Abstract

Cardiorespiratory fitness and heart rate variability in early and late postmenopausal women

Kananda Pereira Lemos[1*], Helena Moreira[1,2], Emília Alves[3], António Amaral[1,2], Catarina Abrantes[1,2]

[1] Department of Sports Science, Exercise and Health, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal.
[2] Research Center in Sports Sciences, Health Sciences and Human Development, CIDESD, Vila Real, Portugal.
[3] Douro Higher Institute of Educational Sciences: Penafiel, Porto, Portugal.

*E-mail: kanandapereira@outlook.com

Conflict of interest: nothing to declare. **Funding:** nothing to declare.

Limited information is found on the interaction between increased postmenopausal time, cardiorespiratory fitness level, and its relation to the autonomic nervous system. The aim of the present study is to investigate the relationship between cardiorespiratory fitness and heart rate variability (HRV) in early and late postmenopausal women. The sample comprises 75 postmenopausal women included in the "Meno(s)pausa+movimento" program. They were divided into two groups, according to the time of postmenopausal, that is, 42 early postmenopausal (EPM) women (52.27 ± 4.31 years old; Systolic blood pressure [SBP] = 123.20 ± 15.14 mmHg; diastolic blood pressure [DBP] = 85.13 ± 8.18 mmHg) and 33 late postmenopausal (LPM) women (61.45 ± 4.89 years old; SBP = 132.62 ± 12.99 mmHg; DBP = 82.19 ± 7.42 mmHg). SBP, DBP and resting heart rate (HRr) were measured after 10 minute seated rest period (M6 Confor, OMRON, Kioto, Japan), and HRV sympathetic and parasympathetic components through the Sphygmocor Atcor device electrocardiogram during

30 minutes after 10-minute in a lying position. The cardiorespiratory fitness ($mL \cdot kg^{-1} \cdot min^{-1}$) was estimated through the indirect and sub-maximal YMCA protocol on a cycle ergometer (Monark 839E, Vansbro, Sweden). Results reveal that cardiorespiratory fitness is classified as poor, both in the early postmenopausal group (25.86 ± 5.23 $mL \cdot kg^{-1} \cdot min^{-1}$) and in the late postmenopausal group (24.09 ± 6.52 $mL \cdot kg^{-1} \cdot min^{-1}$). In HRV parameters, RMSSD values were 35.50 ± 17.06ms in the EPM and 25.54 ± 10.89ms in LPM, SDNN values were 46.30 ± 16.76ms in the EPM and 35.07 ± 13.61ms in the LPM, RRtri were 9.07 ± 3.11 in EPM and 7.19 ± 2.19 in LPM group and the Total Power values were 924.0ms² (440.50 – 1510.0ms²) in the EPM and 416.0ms² (258.0 – 904.5ms²) in the LPM, these parameters were significantly lower in LPM group compared to EPM ($p < 0.05$). Other indices like the LFnu, HFnu and the LF:HF ratio show no significant differences between groups. Pearson correlation coefficient did not show a significant correlation between cardiorespiratory fitness and HRV parameters in both groups. Our study indicates no correlation between cardiorespiratory fitness and HRV in early or late postmenopausal women but shows that the increase in postmenopausal time is related to a reduction of global heart rate variability and an increased predominance of the sympathetic autonomic component.

Keywords: climacteric, cardiorespiratory stress test, autonomic nervous system, cardiovascular diseases.