The influence of heart rate variability and psychosocial factors on stiffness carotid at menopause

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Context At postmenopause cardiovascular risk (CVD) is evaluated with the carotid intima-media thickness (IMT) and arterial elasticity. Heart rate variability (HRV) indicates autonomic influence, important for CVD risk. Objective To compare ultrasonographic carotid indices and HRV at peri- and postmenopause; testing the association of carotid indices with symptoms, hormones, stress, and psychosocial factors. Methods We compared groups according to menopausal stage, 17ß-E2, BMI and waist. Factors associated with carotid indices in the whole sample were tested with multiple regression. Patients Women aged 45 to 57 at peri- (n=50) and postmenopause (n=50). Main Outcome Measures Scores of depression, anxiety, sleep disturbances, and stress-related measurements, anthropometric data, smoking, and alcohol consumption. Serum 17ß-E2, FSH and cortisol were quantified. HRV was recorded with a wireless watch for 4-hours, calculating time- (SDNN, rMSSD, and pNN50 %), and frequency (LF, HF and LF/HF ratio) domains. We evaluated IMT, internal carotid artery resistive index, β-stiffness index and arterial distensibility. Results Carotid indices were similar at peri- and postmenopause; SDNN was higher at postmenopause. Women with lower estrogens had increased IMT and resistive index. Obese women had lower pNN50% and higher LF. We found IMT positively associated with non-HDL-cholesterol (p<0.03); resistive index was associated positively with LF (p<0.01), and negatively with effort/reward imbalance (p<0.03); β Stiffness index was inversely related to 17ß-E2 (p<0.03); distensibility correlated with HF (p<0.02), testing for confounding variables, non-HDL-cholesterol and creatinine were included. Conclusions Indices of early carotid damage were related with HRV, suggesting that sympathetic tone is related to CVD risk. Creatinine and lipid alterations also had effect on elastic properties.

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