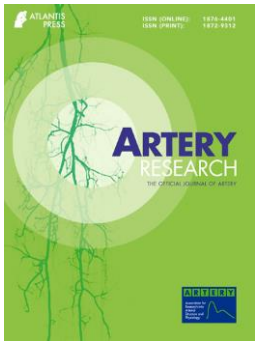

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PO-01

ANIMAL MODELS OF LOCAL AORTIC STIFFENING: THE EFFECT OF SALT IN SHRSP

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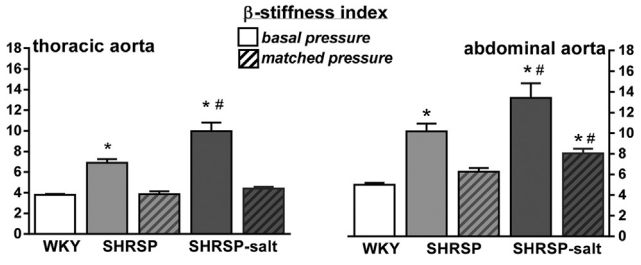
Objectives: The cardiovascular risk associated with central artery stiffening is recognized but better understanding of the mechanisms and therapeutic strategies are needed. Therefore, animal models for evaluating stiffness are crucial. We and others use different approaches to calculate aortic stiffness. Pulse wave velocity (PWV) is relatively easily measured and is indispensable, despite being highly influenced by blood pressure. Local determination using echotracking allows us to determine stiffness at various levels of the arterial tree and to measure the pulsatile diameter wave (distension). Previously, using this technique, we have shown the presence of an aortic wall stiffening in spontaneously hypertensive rats (SHR) when the pressure effect is complicated by a reduction of nitric oxide or by aging (1-2). Age, endothelial dysfunction and salt are main contributors in human cardiometabolic pathologies.

Methods: We have evaluated the effect of salt in stroke prone SHR (SHRSP). SHRSP-salt (4.5 % NaCl diet 5 weeks, n=7), compared to normotensive rats Wistar Kyoto (WKY) and SHRSP with normal diet (n= 6-6). After pentobarbital anesthesia, parameters were measured at basal and again at reduced blood pressures (following acute clonidine administration), in the thoracic (TA) and abdominal aorta (AA).

Results: At basal pressure both the TA and AA presented decreased distensibility, distension and distension-pressure loop, increased β-stiffness index (figure) and local PWV in the SHRSP and SHRSP-salt. Following clonidine administration to match the WKY basal blood pressure (130 mmHg), only parameters acquired from the AA of SHRSP-salt remained altered.



Conclusions: This study confirms the potency of ultrasonic derived stiffness measurements and that aortic remodeling is non-uniform along the aortic trunk. It shows that salt in addition to hypertension develops central artery stiffening; after 5 weeks, the TA presents a pressure-dependent and AA both pressure dependent and independent stiffening.

(1: Vayssettes-Courchay et al., 2011, 2: Lindesay et al., 2016)

PO-02

NO SEX DIFFERENCES IN THE CARDIOVASCULAR RESPONSE TO MENTAL-STRESS IN OLDER ADULTS

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Mental stress elicits increases in blood pressure (BP) and arterial stiffness, the magnitude of which is subject to sex differences. Women tend to have blunted increases in BP compared to men that are driven by cardiac excitation, rather than changes in peripheral resistance. These sex differences have primarily been documented in younger, pre-menopausal women, and through the measurement of peripheral (i.e. brachial) BP, which may differ from responses in the central vasculature (i.e. carotid artery).

Purpose: Investigate sex differences in the cardiovascular response to mental stress among older adults.

Methods: 91 older adults (n=46 men, 68±6 yrs, BMI 27.1±3.7 $kg \cdot m^{-2}$; n=45 women, 67±7 yrs, BMI 25.3±3.6 $kg \cdot m^{-2}$) underwent cardiovascular measures at rest and during a mental stress protocol. Mental stress was induced using a 4-minute computerized incongruent Stroop task. Brachial and carotid systolic (SP), diastolic (DP) and pulse pressure (PP) were measured via a brachial oscillometric cuff and applanation tonometry, respectively. Carotid waveforms were calibrated to brachial mean pressure and DP. Carotid-femoral pulse wave velocity and common carotid artery (CCA) elastic modulus (Ep, calibrated to carotid SP and DP) were assessed as measures of aortic and carotid stiffness, respectively.

Results: Significant group effects were detected for brachial SP, PP, HR, and PWV, with men having greater PWV, but lower BP than women ($p<0.05$). Significant time effects were observed for brachial and carotid pressures, HR, PWV, and CCA Ep, which increased during mental stress. No significant sex-by-time interactions were detected, indicating similar responses to mental stress between sexes.

Conclusions: Mental stress resulted in acute increases in peripheral and central blood pressure and large artery stiffness. Although men had consistently higher PWV and lower brachial BP than women at rest and during mental stress, the magnitude of the cardiovascular responses to mental stress were similar between sexes.

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