5.1: COMMON CAROTID ARTERY PROPERTIES ARE RELATED TO SYMPATHETIC OUTFLOW AND CARDIOVASCULAR VARIABILITY

D. Hering, K. Czechowicz, R. Nowak, W. Kucharska, P. Brands, P. Boutouyrie, S. Laurent, K. Narkiewicz

To cite this article: D. Hering, K. Czechowicz, R. Nowak, W. Kucharska, P. Brands, P. Boutouyrie, S. Laurent, K. Narkiewicz (2011) 5.1: COMMON CAROTID ARTERY PROPERTIES ARE RELATED TO SYMPATHETIC OUTFLOW AND CARDIOVASCULAR VARIABILITY, Artery Research 5:4, 142–142, DOI: https://doi.org/10.1016/j.artres.2011.10.219

To link to this article: https://doi.org/10.1016/j.artres.2011.10.219

Published online: 14 December 2019
The relationship between sympathetic activity and common carotid artery (CCA) properties is unknown. We therefore tested the hypothesis that mechanical properties of arterial wall are independently linked to muscle sympathetic nerve activity (MSNA) and cardiovascular variability.

**Design and Methods:** We measured MSNA (microneurography), heart rate (ecg), arterial pressure (Finapres) and CCA properties (ART.LAB system) in 20 subjects with high normal blood pressure and newly detected stage 1 hypertension (18 males, age 36.2 ± 2.2 yrs, BMI 27.1 ± 1 kg/m², mean ± SEM). SBP and RR-interval variabilities were defined as the standard deviation of the means.

**Results:** MSNA averaged 27.3 ± 3 bursts/min., mean CCA intima-media thickness (cIMT) was 0.57 ± 0.03 mm, carotid distension was 499 ± 27 μm, systolic (5) Carotid Wall Stress (CWS) was 119 ± 6 kPa, pulsatile (P) CWS was 46 ± 3 kPa. CCA IMT was related to MSNA (r = 0.54; P < 0.01), and SCWS (r = -0.84; P < 0.0001), but not to variability of SBP (r = -0.27; P = NS) or RR-interval (r = -0.26; P = NS). MSNA was associated with reduction in carotid distension waveform (r = -0.54; P = 0.01), SCWS (r = -0.45; P < 0.05) and PCWS (r = -0.57; P < 0.01). CWS was not linked to variability of SBP or RR-interval. Changes in CCA diameter were positively related to RR-variability (r = 0.49; P < 0.05), but not to variability of SBP (r = 0.3; P = NS). The correlations between MSNA and CCA properties remained significant after adjustment for age, body mass index and blood pressure.

**Conclusions:** (1) Distension of the common carotid artery is related to muscle sympathetic nerve activity and cardiovascular variability. (2) Intima-media thickening and carotid wall stress are linked to sympathetic activation, but not to altered cardiovascular variability.